THE

AMERICAN JOURNAL OF PHARMACY.

MAY, 1859.

OBSERVATIONS ON THE ACIDS EXISTING IN THE JUICES OF RHUBARB STALKS, TOMATOES AND QUINCES.

By Thomas A. Lancaster.

(*An Inaugural Essay presented to the Philadelphia College of Pharmacy.*)

My attention was attracted to the subject of certain acid vegetable juices, by a suggestion of my preceptor, William Hodgson, Jr., as a matter of importance to those interested in organic chemistry, as the history of the chemical constituents of those juices is but imperfectly known. Considering it therefore well worthy of further chemical investigation, I have attempted the examination of the acid constituents of Rhubarb Stalks, and the fruits of the Tomato and Quince.

I have no doubt that in a general way the properties of the juices of rhubarb, tomatoes and quinces, are pretty well known to the past and present students of chemistry; but as regards the true nature of their respective acidulous constituents, no thorough and reliable explanation has yet been given, so far as I can discover after much research through some of our best chemical authorities.

In investigating this subject the labor was greatly increased by the want of some work sufficiently detailing the mode of proceeding, in order to certainly and readily distinguish between citric, tartaric and malic acids.

Experiment 1.

Rhubarb.—One pound of the freshly cut stalks of the Rheum Rhaponticum, or culinary rhubarb, was grated and subjected to strong expression through muslin, which yielded thirteen fluid

ounces of juice; the dregs were washed with a fresh portion of water and pressed again; the resulting liquors were then mixed together and filtered, and evaporated over a slow water bath to the consistence of a thin syrup, and set aside for a few days, for further evaporation and to crystallize; upon examining the crystals, I found them, to be very irregular, and clotted together; upon recrystallizing them beautiful white crystals were obtained, resembling in appearance "salt of sorrel," only more regular. The crystals were of a rhomboidal shape, and had an excessively acid taste. They agreed in form, taste, and general appearance with other samples of salt of sorrel.

The mother liquor then from the first crystallization was further evaporated, and set aside again to crystallize; but I found that although still strongly acid, it would not crystallize, owing, I supposed, to its excessive thickness or tenacious nature. Being aware that the mother liquor of tartaric acid and of crystallizable sugar acted in the same manner, and there being nothing else as yet to guide me in assigning a reason for it, I attributed the same tendency to change by continued heat to the acid in rhubarb.

2. Suspecting this acid liquor contained potassa, I proceeded in the following manner to ascertain the fact. I evaporated the above syrupy mother liquor to the consistence of an extract, then placed it in a crucible and exposed it to a gentle heat for about an hour, to destroy the organic matter; the incinerated remains were then treated with hot water to dissolve out the potassa; the solution was then evaporated to dryness, when there remained evidently a portion of carbonate of potassa. This dry carbonate weighed nearly two and a quarter grains, indicating an equivalent of four and three quarter grains of binoxalate of potassa.

3. One pound of fresh stems of rhubarb yielded by expression thirteen fluid ounces of juice, which when filtered only measured twelve and a half ounces, leaving about half an ounce of fibrous matter in the filter. The juice was then evaporated, and allowed to crystallize; as before mentioned, and upon a second crystallization, it yielded crystals of a beautiful color, to the amount of seventy grains.

Experiment for Oxalic Acid.

4. To prove whether it was really oxalic acid which existed in the salt from rhubarb, six grains of the crystals were dissolved in a small portion of water, and the acid solution was precipitated with lime water, affording a white deposit of oxalate of lime. I then added an excess of acid (from rhubarb) to the precipitated solution; but it still remained insoluble in it. This test clearly shows the presence of oxalic acid; but whether there is not a mixture of acids, this test cannot alone be relied upon to prove.

Experiment for detecting the presence of other acids.

5. Not being positive of the accuracy of the above test, six grains more of the acid were taken, and dissolved in a small portion of water; the solution was precipitated with lime-water, yielding a copious white precipitate of oxalate of lime; the precipitate, washed and carefully dried, was transferred to a crucible, and a slow heat applied for about an hour, for the purpose of detecting the presence of any other acid; but after the application of the heat, and the oxalate being converted into a carbonate *without blackening* the precipitate, I consequently concluded that no other acids were present, but that the acid salt existing in rhubarb stalks is nothing more than an acid oxalate of potassa.

The following experiment shows that it was a binoxalate:

Experiment for ascertaining the amount of potassa.

6. In examining the crystals of rhubarb, to ascertain the amount of potassa contained in them, I proceeded in the following manner: Ten grains of the acid crystals were dissolved in a small portion of water; this solution was then precipitated with pure chloride of calcium; the precipitate, being oxalate of lime, was then carefully collected, washed and dried, weighing nearly four and a quarter grains; thus agreeing as nearly as could be expected, considering the small quantity under examination, with the atomic proportion of binoxalate of potassa, as 146 : 64 :: 10 : 4.4.

7. To prove the accuracy of the above, I took the same quantity of acid salt, placed it upon a silver plate, and applied the heat of a spirit lamp to destroy the organic matter. The charred

mass was then treated with hot water, filtered, evaporated to dryness, and when carefully collected, weighed four and a quarter grains.

Seeing that the amount of potassa did not agree with that of the binoxalate according to the tables in the U. S. Dispensatory, and repeating the test over and over again, I then attributed the difference to some impurities existing in the crystals, which I had not got rid of before the process of crystallization; but on examining the above processes, I found them correctly made, and therefore believed that something was wrong in the calculation.

On examining the U. S. Dispensatory, I found it to state the atomic weight of binoxalate of potassa, without allowing for the water of crystallization making it, 119·2, which had led me into the above error of calculation. On heating a few grains of the crystals, ebullition ensued, showing the existence of water of crystallization; which also showed, that there must be an omission in the quotation of the Dispensatory.

Being greatly surprised at the result, and suspecting some fallacy existing somewhere, I examined the Dispensatory again, along with Turner's Chemistry, and found that Turner quoted binoxalate of potassa as containing three atoms of water, making 146. instead of 119. Now resuming my calculations I found that the acid salt in rhubarb agreed in the amount of potassa to the binoxalate as stated above.

The Tomato.

I then proceeded to investigate the tomato (Solanum Lycopersicum), red variety, which from its very extensive and popular use needs no further comment than merely stating the original source of the vegetable, which was from South America, where it was very much esteemed amongst the Portuguese and Spaniards for making a sauce, considered by them very nutritive and cooling; probably owing to the acidulous properties contained in it.

According to my experiments, the acid seems to exist as an acid salt, but the quantity of acid obtained in a crystalline form from one pound is a very small amount.

8. One pound of freshly selected fruit of the Solanum Lyco-

persicum, or tomato, was grated and subjected to strong expression through muslin; which produced eleven ounces of juice. The dregs were treated with a fresh portion of water, and again pressed; the two liquors were then mixed and the mucilaginous matter precipitated with albumen, boiling the juice to coagulate the albuminous matter. It was then filtered and allowed to evaporate slowly by means of a water bath to the consistence of a thin syrup, and set aside for further evaporation, and to crystallize; but on examining the syrupy liquid, I found the process of crystallization had not taken place as I anticipated, probably owing to the thickness of the acid liquid, by which I considered it impossible to crystallize the juice alone.

Suspecting, from the action of the juice on litmus paper, its not being a free acid, but existing in the fruit as an acid salt, to endeavor to ascertain the fact more precisely I pursued the following course.

The syrupy liquid from the above experiment was placed in a crucible, and heat applied so as to destroy the organic matter of the extract. The incinerated mass was then treated with hot water, so as to dissolve out the suspected potassa; the solution was then evaporated to dryness, which gave as the result eleven grains of a white powder, which appeared to be carbonate of potassa, by the addition of a few drops of acetic acid liberating apparently carbonic acid.

9. I proceeded again with one pound more of tomatoes, treating it in the same manner to get rid of the albuminous matter. I precipitated the acid liquor with a concentrated solution of acetate of lead and washed the precipitate thoroughly with cold water. I then boiled the lead salt in hot water a few minutes, it was then thrown on a filter and allowed to dry.

The precipitate was powdered and suspended in hot water, and this raised to the boiling point, and while still hot it was decomposed with sulphuretted hydrogen and the precipitate thoroughly washed with successive portions of hot water; the acidulous liquor was then evaporated to the consistence of a thin syrup, and allowed to crystallize. On examining the crystals I found their form to be six sided tables, and their taste somewhat like cream of Tartar. The amount of crystals from one pound of the fruit was only ten grains.

A few grains of the crystals were burnt and the residue was proved to be lime by dissolving it in muriatic acid, and precipitating it with oxalic acid, throwing down a white precipitate of oxalate of lime; thereby proving lime to be the base; this salt then obtained by the process for malic acid appears to be acid malate of lime.

It also agrees with acid malate of lime in its atomic proportion, as 207.5 is the equivalent of acid malate of lime in the crystalline state; and it will be seen by the following experiment that it is the same in the crystals obtained from tomatoes.

I took twenty parts by weight of the acid malate, and burnt it until all the organic matter was destroyed, which left a product of two and a half parts, being about one-eighth; this experiment may indicate pretty clearly that the crystallizable principle in tomatoes is acid malate of lime, associated in the juice, as appeared afterwards, with citric acid, or rather with acid citrate of potassa, which will not crystallize.

My attention was at this point of my experiment called by Professor Procter to an analysis of the tomato by Dr. Plummer, published in the Journal of Pharmacy, vol. 23d, page 165. He examined the yellow variety of tomatoes and detected citric acid. I applied his tests to the red variety, and found them to produce the same results, from which I have no doubt at all that the uncrystallizable salt exists as citrate of potassa with excess of citric acid.

10. One pound of tomatoes was treated as before, yielding eleven ounces of juice; it was then clarified filtered, and neutralized with ammonia, which produced a dark wine-red color; it was then evaporated down for the purpose of obtaining dry citrate of ammonia, but owing to the large quantity of organic matter, I was able to obtain nothing but an extract.

Thus failing in this experiment, I was unable to proceed further in arriving at the definite amount of citric acid. I used other alkalies with precisely the same results.

The Quince.

The history of the quince (Cydonia Vulgaris) no doubt we are well acquainted with, being cultivated as an ornamental tree in

our gardens, and the fruit much improved, owing to the great demand there is for it in making tarts and jellies.

But the examination of the juice was at first tedious and baffling, owing in a great measure to the large amount of mucilaginous matter diffused through the fruit. The great difficulty to contend with in trying to crystallize the juice alone without combining it with other salts, arose from the mucilaginous matter [pectin, &c.] which on cooling had a tendency to gelatinize.

But with repeated experiments I am happy to state the result is more than I anticipated.

11. I extracted the juice from one pound of Cydonia Vulgaris, or quince, treating it in the same way as the tomato, and obtained twelve ounces of juice.

The acid juice was then precipitated with a concentrated solution of acetate of lead, and the precipitate thoroughly washed with cold water.

The washed precipitate was then boiled in hot water a few minutes, and allowed to stand until the precipitate subsided; the clear liquor poured off, it was allowed to boil again; and while it was suspended in the hot water, was decomposed with sulphuretted hydrogen, and the black precipitate washed with successive portions of hot water. The filtered liquor was then evaporated over a slow water bath to four ounces, and set aside; on cooling, it crystallized in beautiful transparent needle-shaped crystals. The mother liquor was poured off, and the crystals thrown on bibulous paper and allowed to dry in a very dry atmosphere. The mother liquor was further evaporated, and set aside to crystallize. The amount of bimalate of lead thus obtained from one pound of quince was twenty five grains.

The crystals are of a beautiful white needle-shape, and deliquescent. On boiling the salt in hot water it assumed a pitchy consistence, which on cooling is rendered very brittle.

In the above mentioned process, the potassa, uniting with the acetic acid of the lead salt, was washed away from the precipitate and lost; but by evaporating a fresh portion of juice and burning the product, I found that one pound of the fruit yielded ten grains of dry carbonate of potassa.

It will be perceived from the foregoing remarks on the acid juices above named, that from rhubarb stems was obtained bin-

oxalate of potassa, KO, 2 (C_2 O_3) + 3HO; from the quince malic acid, $\bar{M}$, HO, and from the tomato, acid malate of lime in connection with acid citrate of potassa.

The relative proportions are as follows: one pound of rhubarb stems yielded 13 ounces of juice, which produced crystals of bin-oxalate of potassa to the amount of 70 grains. The same amount of quinces, (one pound,) which produced 25 grains of crystals of malic acid. The tomato, one pound, yielded 11 ounces of juice, which produced 10 grains of crystallized acid malate of lime, besides an unascertained amount of acid citrate of potassa.

I am sorry to say that the season had by this time so far advanced as to not allow time to investigate some of our other important vegetable acid juices, which I had at first in view, and which are of deep interest to the history of organic substances; but should time afford me another opportunity, a further consideration of these important juices may be expected hereafter. In offering this chemical investigation as a small contribution to the list of our chemical analysis of organic substances, I cannot but indulge the hope that my endeavors have not been altogether ineffectual, though the results frequently baffled me; but that the object at which I first aimed has at length been in part, if not wholly, obtained so far as the juices above mentioned are concerned.

Philadelphia, 11th mo. 1st, 1858.

ON NITROBENZOLE.

By Dr. F. Mahla, of Chicago.

The article, which is at present so much used for perfumery-purposes, known under the general name of nitrobenzole, is not, as it is generally supposed, the nitro-combination of the benzole alone. The following will show that the article which is sold in commerce and represented to be nitrobenzole is a mixture of different substances.

Some time ago I got from a drug-house of Baltimore a bitter almond oil, which I supposed to be adulterated with the artificial bitter almond oil, because its color was rather dark yellow

Searching for a good method to find out such a falsification, I looked over my different literary works for its chemical properties, and found there that the descriptions of nitrobenzole as they are contained in the different works do not accord with each other. Wohler, in his "Elements of Organic Chemistry, 1848," describes it as a substance smelling like the oil of cinnamon, while others say it had the smell of the true bitter almond oil. To ascertain which of these statements was correct, I concluded to prepare some nitrobenzole myself.

I thought first to make it out of commercial benzole, and procured some samples from different manufacturers, but found to my astonishment that none of these substances, said to be benzole, contained any accountable amount of the true benzole. One of these samples, from the coal oil factory of Dr. Blaney of this city,* was subjected to a closer examination by heating it in a glass retort, in which I inserted a thermometer through the tubulus.

At 235° F. the liquid began to distil slowly, the quicksilver still rising, although the heat employed was always the same. The first point at which it proved to be stationary, was for a short time 266° F., and as soon as the quicksilver began to rise again a new receiver was adapted to the retort. The same was done another time at 293° and a third time at 300°. The three obtained products were perfectly colorless, and remained so, with the exception of the last one, which became soon darker, assuming a deep yellow color by the action of the light. In the retort remained still a portion of the original substance, but my object being to ascertain whether this article contained benzole or not, I thought it not necessary to go farther, because the benzole begins to boil already at 186° F.

Not succeeding to find any commercial benzole, out of which I was able to prepare the pure benzole, I concluded to make some from the benzoic acid. Two ounces of this acid were therefore distilled with about six ounces of hydrated lime, and about 5½ drachms of pure benzole were obtained. This was carefully introduced in small quantities into an equal quantity of a mixture of concentrated sulphuric and nitric acids, kept cool with ice. After the action was over, the whole was for a few days

*Dr. Blaney used to make it out of gas-tar.

more agitated and then poured into cold water. After washing the oily product different times with water, it represented a clear nearly colorless liquid, with a smell between cinnamon and bitter almond oil, but more resembling the first one than the latter. This I found also stated in a notice contained in Gmelin s Handbook of Chemistry, 1856.

Basing upon this, I thought it not impossible, that the nitrobenzole, as it is sold in commerce, contains, if it does any, but very little of this substance, and is in most cases only a mixture of nitro-combinations of various homologous carbo-hydrogens, which are found among the products of the distillation of coal-tar, viz. toluol, etc. etc.

I heated, therefore, a portion of commercial nitrobenzole dissolved in alcohol with gaseous ammonia and sulphuretted hydrogen for a day, but could not, either with nitric acid or chloride of lime obtain any of the characteristic reactions of anilin.

I resume, therefore: the commercial nitrobenzole is not what it is represented to be, and deserves another name.

ON THE PREPARATION OF NITROBENZOLE AND ITS DETECTION IN BITTER ALMOND OIL.

By Dr. F. Mahla.

Before I had finished the above described operation, I found in one of my German periodicals a method for the discovery of an adulteration of the bitter almond oil with nitrobenzole. This method is based upon the fact, that genuine bitter almond oil, treated with an alcoholic solution of caustic potassa, is transformed into the benzoate of potassa, while nitrobenzole under the same treatment changes into a dark brown resin, insoluble in alcohol, but soluble in ether. This resin can be obtained from an ethereal solution in yellow crystals, forming the azobenzid.

The test is best made in the following manner:*

To 15 grains of the suspicious oil, dissolved in
2 drachms of alcohol, are added
15 grains of caustic Potassa,

*[Note.—The test referred to in the German periodical is that of John M. Maisch, of Philadelphia, published originally at page 544, 1857, of this Journal.—Ed. Amer. Jour. Pharm.]

and the whole beaten until about one-half is evaporated. If the oil is pure, a brownish yellow solution without any crystalline deposit will be obtained; if it contains nitrobenzole, a larger or smaller quantity of a hard brown crystalline mass will precipitate in the colorless supernatant liquid.

I will only add that in preparing nitrobenzole, it often occurs, after mixing the raw benzole with the acids, that the product assumes a dark brown color, and the manufacturer, to make it saleable, throws the whole with a proportionate quantity of water into a still and distils it over.

The remainder contains like the wash-waters a pretty large quantity of picric acid.

ON HYDRARGYRI IODIDUM.

By Roland Seeger, of Philadelphia.

In the lately published Proceedings of the American Pharmaceutical Association, among other papers of great interest by Dr. E. R. Squibb, one concerning the article which forms the subject of this essay attracted my attention. I was the more interested in this subject from the fact, that the conclusion which the high authority arrived at—to wit—the abandonment of the preparation, was certainly to be regretted, as the practitioner has found it a valuable remedy in combatting disease.

I find the first mention of this protosalt of mercury in M. Henry's paper, which appeared in the August number of the "Journal de Pharmacie" for 1828, translated to the pages of our own Journal for October, 1829 page 204. This, the original process, was the double decomposition of the proto-nitrate of mercury by a solution of iodide of potassium.

This plan was objectionable in consequence of the difficulty attendant upon the preparation of a pure mercurous nitrate; and I find on page 358 of the third volume of our Journal, translated from the "Journal de Pharmacie" for August, 1831, a memoir by M. Berthemot, reviewing the labors of M. Henry on this subject. So unsatisfactory were the results of his experiments, that he recommended the process of triturating the

elements in their atomic proportions as a substitute, which plan has held ground till the present time.

There have, nevertheless, objections been urged against this process—and not without reason—for it is found that there is always some metallic mercury or red iodide present as a contamination; the latter may be removed by washing with strong alcohol, but this will not remedy the mercurial contamination. M. Boutigny, of Paris, proposed to escape these sources of trouble by grinding the proto-chloride of mercury with the proper proportion of iodide of potassium, to a fine powder, washing with boiling water and drying in the dark, but it has been found to fail, the product being contaminated with calomel and metallic mercury.

From the most careful examination of the whole subject, both by experiment and the sifting of all that has appeared in every authority accessible to me, I have arrived at the conclusion, that the true process is, the double decomposition of a proto-salt of mercury by pure iodide of potassium, and this opinion I find supported in Gmelin's invaluable Treatise, vol. vi. page 35, where he states, that the mercurous acetate when ground together with pure iodide of potassium, and permitted to remain for some time in contact and then washed, would yield a proto-iodide of mercury, which is free from the objections urged against the product of the formula which have been noticed in the earlier part of this paper.

The most ready way of preparing the mercurous acetate, I have found to be the decomposition of the proto-chloride of mercury, by equal quantities of caustic potassa, dissolved in four times its weight of distilled water, washing till solution of nitrate of silver gave no evidence of chloride of potassium; then heating acetic acid on an excess of the oxide, filtering while hot, and then drying the flaky crystals, which should be treated as before stated.

The formula (see Watts' note in Gmelin's Handbook, vol vi. 35) which I offer for its preparation is—

Take of Proto-Acetate of Mercury,	259 grs.
Pure Iodide of Potassium,	162.5 grs.

Grind the crystals of the mercurous acetate to a fine powder, then add the iodide dissolved in a small quantity of water, tri-

turate for 15 minutes very thoroughly, then wash with warm water, and dry in the dark.

In view of the conflicting opinions of chemists in regard to the equivalent number of mercury, it is much to be regretted that the example of the Dublin College has not been followed, in giving names to the two iodides, which are founded upon their constant and distinctive peculiar colors, thus obviating the perplexing confusion to students, which the frequent use of different names for the same article occasions.

ON LIQUOR FERRI IODIDI.

By Dr. Robert Battey.

Complaints are often made of the difficulty encountered in keeping and dispensing the officinal Liquor Ferri Iodidi in good condition. Various suggestions have been made, by way of remedy for the evil, some proposing modifications of the formula, others the use of small ground stoppered vials of transparent or opaque glass.

In my own experience this trouble was early encountered and easily overcome by the use of clean iron wire as an additional protecting agent. I much prefer it in the form of wire to iron filings, or iron by hydrogen, which I have heard spoken of. Immediately upon the completion of the preparation, I take a piece of fine iron wire, clean it well with sandpaper, coil it around a glass rod or cedar pencil, draw out the coil to nearly the length of the bottle and drop it in. If the bottle be a large one, I use two or three of these coils. In dispensing small quantities, I have found it convenient to use a straight piece of larger wire passing through the center of the corks (I never use glass stoppered vials) and to the bottom of the vial. I do not deem it *necessary* that the wire pass to the bottom of the vial, as the charge commences at the surface, but have thought that it gave some additional security if long kept on hand.

With this expedient I have encountered no difficulty in keeping from two to five pounds of the solution in one shop bottle, and dispensing it, day by day, in small parcels. I have not found the presence of the wire in the vial to detract from its

good appearance, or to be in any respect objectionable, if it be bright and either neatly coiled or passed through the cork, evidencing care and design in the arrangement. Upon several occasions has this precaution been marked and openly commended by physician and patient.

I have occasionally by this means restored (in appearance at least) deteriorated samples, but think in this, as in every thing else, an ounce of prevention is better than a pound of cure.

I would suggest that the formula be allowed to remain unaltered, and the use of the wire added to the directions following it in the Pharmacopœia.

Rome, Georgia, Feb. 1859.

ON PODOPHYLLIN.

By Harvey Allen.

(*An Inaugural Essay.*)

As my object was to endeavor to find in which resin the virtues of Podophyllum peltatum resides, I will not attempt a description of the plant, or an analysis of it, but will confine my remarks to Podophyllin, the so-called active principle.

By analysis, Podophyllum is said to contain "albumen, gum, starch, extractive, lignin, gallic acid, fixed oil, traces of volatile oil, and two resinous principles, one soluble in alcohol and ether and the other soluble in alcohol only; both resins were found to possess the active properties of the root; six grains operated as a drastic cathartic with some emetic effect."

It was suggested to me that the ethereal resin was the active one, and these few experiments were made to ascertain if such was the case. One pound avoirdupois of Podophyllum peltatum, in coarse powder, was macerated with alcohol for a day; it was then transferred to a percolator, and alcohol added, until it passed without taste; six pints were used. The resulting tincture was then evaporated very carefully by means of a water bath to the consistence of a thin syrup, and thrown into about six times its bulk of water, by which the resin was precipitated, at first almost white; it was then separated by filtration and carefully

dried; the yield was two hundred and thirty-five grains, of a yellowish white color, of scarcely any smell, and of a feebly bitter, not unpleasant taste: it was found to be quite active in the dose of three quarters of a grain.

A portion of this resin was repeatedly treated with ether, the ethereal solutions poured off and allowed to evaporate spontaneously; a greenish yellow resin was obtained, which was found to constitute four-fifths of the weight of the original resin. This, through the kindness of one of the Professors of the College, was repeatedly tried in one of the hospitals in this city, and found to be very active in the dose of half a grain; I also gave a portion of it to two other physicians whose experiments corroborated the above; so I think that there is no doubt but that the ethereal resin is the active one. The resin insoluble in ether was of a reddish, brown, color and in the dose of two grains it produced no effect. To sum up the result of my experiments; the etheral resin, as obtained by exhausting the root with alcohol, evaporating, and precipitating with water, and treating with ether, constitutes four-fifths of the resin found in the root; that it is the active one, and the dose to begin with is half a grain; that the alcoholic resin is comparatively, if not entirely, inert; still, as it exists in such a small proportion, it can scarcely be considered as objectionable if the resin is properly prepared.

For the sake of experiment a portion of podophyllin, of a light brown color, manufactured in this city, was treated with ether; only three-fourths of it was soluble in that menstruum and strange to say, it had to be given in the dose of one and a half grains to produce any effect; what it was owing to, I know not.

The alcoholic resin was not tried.

Of a sample of still darker color, manufactured in Cincinnati, only one fourth was soluble in ether; it was not tried, as I think the ethereal is the active one, no matter in what proportion it may exist in the various samples.

Philadelphia, February, 1859.

ON THE NEW GERMAN SYSTEM OF WEIGHTS.

To the Editor of the American Journal of Pharmacy:

Dear Sir,—The "Archiv der Pharmacie," May, 1858, page 257, &c., contains tables for the reduction of the former medi-

cinal weight to the weight which is hereafter to be the lawful standard in Prussia, and vice versa. The following extracts will convey an idea of the new system, and also show its relation to the old, now discarded, one.

		1 grain	=	—	Loth.	—	Quint.	—	Cent.	3·65399 Korn.
		5 "	=	—	"	—	"	1	"	8·26996 "
		10 "	=	—	"	—	"	3	"	6·53992 "
		1 scruple	=	—	"	—	"	7	"	3·07985 "
		1 drachm	=	—	"	2	"	1	"	9·23954 "
		1 ounce	=	1	"	7	"	5	"	3·91630 "
1 medicinal lb.	=	12 "	=	21	"	—	"	4	"	6·99557 "
1 civil lb.	=	16 "	=	28	"	—	"	6	"	2·66076 "

		1 Korn.	=	·273 grains.
		5 "	=	1·367 "
10 Korn.	=	1 Cent.	=	2·737 "
10 Cent.	=	1 Quintchen	=	27·374 "
10 Quint.	=	1 Loth.	=	4 drachms, 1 scruple, 13·740 grains.
30 Loth.	=	1 lb.	=	17 ounces, 52·20 grains.

This new system of weights appears to have been legalized by the various German States comprising the "Zollverein," wherefrom it has received the name "Zollgewicht." I do not know how its unit was obtained, but from its term Korn (English rye, grain or seed,) it is to be inferred that the medium weight of some seed, probably rye, has been selected for it.

Dr. L. F. Bley, the editor of the "Archiv," makes the following remarks: "The introduction of these new weights for the use in medicine will be a source of annoyance until the physicians have become thoroughly acquainted with them. All difficulties might have been obviated if the French grammes-weight had been chosen, which has long been adopted in science."

In the above tables it must be remembered that the old Prussian grain is equal to ·96 grs. Troy, and the old Prussian medicinal pound = 5415·1 grs. Troy, and by calculation the weight of the new Prussian, or rather "Zoll pound," is found to be 7720·47 grs. Troy.

It is to be regretted that by this act still more confusion is gained, and from the arbitrary unit and the arbitrary division we may infer that it will have to give way to a more rational system. The labors of our American Committees on weights and measures, we will hope, will produce something nearer to perfection.

Yours, very respectfully,

JOHN M. MAISCH.

Philadelphia, Oct. 20th, 1858.

PHARMACEUTICAL NOTES OF TRAVEL.

By Edward Parrish.

(Concluded from page 113.)

Having extended the previous essays of this series beyond the limits originally contemplated, I shall conclude with a rapid glance at several interesting Pharmaceutical Institutions visited in Paris.

There is so much crowding upon the notice of the stranger in this great metropolis, that if his time is limited he must necessarily make choice of some objects of examination and study upon which to concentrate his attention; and while I felt that all the great historical, political, scientific and social institutions, and in fact every thing that illustrated the peculiar phase of civilization pervading the French Capital, required to be examined as far as my time allowed, I must by no means neglect the opportunity to visit the famous *Ecole de Pharmacie*, which is connected with so many illustrious names in those departments of science tributary to our branch of the healing art.

The school was unfortunately in recess, but by the kindness of Prof. Gaultier de Claubray, whose name is widely known for contributions to chemical science and for an elaborate work on Toxicology, I had an opportunity of visiting its Cabinets, Library, Lecture Rooms, Botanical Garden and Practical Schools, which occupy the site of an ancient convent, called *Hôpital de Lourcine*, and of the first botanical garden in France, founded in 1580.

The building stands back from the street, protected by a wall, and has a porter's lodge at the entrance gate. Its appearance is more modern than most of the Paris institutions of learning; a portion of it has been erected within the past year. If the reader will follow me into the middle passage way, in the main story, we may first enter the examination room, which is a hall of perhaps 20 by 40 feet, handsomely furnished with seats for about 300 persons; the ceiling is high and the walls nearly covered with oil paintings, representing the deceased members of the institution; at one end a platform is erected with desks for the Professors, and another at which the candidate is placed for examination. At stated times, annually,

this hall is crowded with an audience eager to witness the examinations, which here, as in the University, are conducted publicly. From an opportunity I embraced of witnessing the process, as practised upon the medical students, though in each case in presence of only a small auditory, my conviction is strengthened that no advantage is gained by its publicity which is not counter-balanced by its unequal effects upon students of varying temperaments and different degrees of timidity.

Besides the extensive cabinets used by the Professors, embracing each department of our science, separately, there is one appropriated to the students for study, and used in the examinations. Here I observed a method of displaying specimens somewhat similar to that mentioned in describing the English museums. In flat glass cases of convenient height, glass dishes are arranged containing nests of crystals or well selected specimens of drugs, over which are laid plates of glass for keeping out the dust and preventing undue exposure to evaporation.

The lecture rooms are two in number capable of accommodating, perhaps, 300 students. The basement which was formerly occupied by the practical laboratory is now used for some of the heavier chemical operations and for storage.

Passing into a newly erected wing of the College, we reach the practical laboratory, which is divided into several apartments all lighted from above, and perfectly adapted to the purposes to which they are appropriated. There is a dark room, with arrangements for the admission of light for the photographic experiments, which enter into the course of instruction in physics. Each apartment accommodates 18 students, and the series communicate by a gallery raised six or eight feet above the floor, which also communicates with the private laboratories and offices of the Professors. This gallery affords the Professor a complete view of all the students, and of the work tables which are arranged in rows at right angles to it. These work tables are of two kinds separated by aisles, those designed for testings, filtrations, &c., containing the appropriate apparatus and reagents, and those for evaporation, burning off precipitates, and ultimate organic analysis. On the last named tables, at suitable intervals, were closets, inclosed with sash, and leading into flues, so as to carry off noxious gases, an arrangement highly con-

ducive to the comfort and health of the students and their teachers. The tables were covered with glazed tiles set in cement, believed to be the least objectionable covering on the score of cleanliness and durability yet tried for the purpose.

The situation of the two series of tables is such that each student has a certain space on the test counter, and a corresponding space on the counter for heat operations, and standing between them, manipulates upon either or both at pleasure. The fuel used was of two kinds: gas conveyed by flexible tubes to gas furnaces, and charcoal burned in small counter furnaces. Each apartment has an ample blow-pipe table, and every convenience for glass blowing operations, of which, I was informed, the construction of thermometers, barometers and specific gravity apparatus, are included in the plan of instruction.

Passing from this suite of chemical rooms which realized my highest ideas of a perfect laboratory for instruction, I was conducted into the adjoining botanical garden, which, though not nearly as extensive as the public gardens, was particularly adapted to the instruction of a class of students in the science of Botany. A limited number of plants are arranged according to their several orders, genera and species, in beds just wide enough to permit of their convenient cultivation, and to allow of their ready inspection by the students. The mode of labelling them is worthy of mention; an upright rod driven into the ground very near the plant has a plate secured to it at a suitable angle, to be conveniently read in passing. The names of the genera are engraved on metal plates, the specific names on porcelain plates which are secured to the rod by wire. M. Chatin, the Professor of Botany, to whom I was honored with a note of introduction, was away from Paris; he had accompanied a class of students to Switzerland, in search of objects of botanical interest and instruction. In retracing my steps through the various rooms of the school, it was my good fortune to meet with the venerable Prof. Guibourt, whose name has been for so many years prominently connected with the investigation of materia medica. He was appropriately surrounded by books and specimens, and his dignified and philosophic appearance and manner were well calculated to inspire a stranger with respect. The faculty of this school includes five Professors; their salaries,

which are 4000 francs and upwards, annually, are paid in part by Government, and partly derived from the class. The very large compensation realized for instruction, at some of the Medical Colleges in the United States, is scarcely dreamed of in Europe, where many Professors, whose lives are consecrated to the advancement of science, and whose discoveries have benefitted mankind at large, are satisfied with salaries which, while they keep them in comfortable circumstances, do not allow of the luxurious expenses which the successful merchant or manufacturer may so easily secure. On the other hand, the absence of those unendowed colleges in which scientific instruction is brought within the range of ordinary competition, and in which the profits of the Professor are as precarious as those of any other class of business adventurers, is here a positive advantage to the whole class of scientific men.

The Paris School of Pharmacy has about 300 students annually; these gentlemen all pursue the practical course in the laboratory, besides the lectures. Many of them are engaged in some of the twenty-two Hospitals in Paris, where their wages as Pharmaciens afford them support, while they have sufficient time in the intervals of their duties for the lectures and practical instructions. Each student resorts to the laboratory three times a week, and spends about three hours in its exercises. Of the three years of practice, the first is devoted to the preparation of chemical and pharmaceutical products; the second to experiments in physics, and the third to analysis and the detection of poisons. The degrees are of two kinds, the first entitling the graduate to practice pharmacy in Paris, Montpelier, or any where at pleasure; the second allowing him to practice only in the smaller towns and provinces. The few students remaining in the laboratory at the time of my visit were engaged in finishing the final preparations to be shown as evidences of their skill, at the examinations.

The most interesting of the Pharmaceutical manufactories visited in Paris was that known as the *Pharmacie Centrale des Hôpitaux et Hospices.* This is the general manufactory and distributing establishment for the numerous Hospitals and Alms Houses (*Hospices*) of the city, with the exception of the Military Hospitals, which have a separate pharmacy. It was under the

direction of the eminent Soubeiran, Professor of pharmacy and organic chemistry in the *Ecole de Medicine*, whose painful malady had at the time of my visit progressed to near its fatal termination, recently announced. This institution, like so many of the modern embellishments of Paris, is erected on the ruins of an ancient convent; situated on one of the broad quays extending along the south side of the Seine, in the immediate neighborhood of the Cathedral of Notre Dame, and of the far famed *Jardin des Plantes*, it presents an exterior appearance quite unlike a drug store or manufactory. The residence of the Superintendent occupying part of the front, aids in giving a character of unusual neatness and elegance to the building.

Here, as elsewhere, I received those polite attentions for which the French are so celebrated, and as I was conducted through every part of the establishment, might have recorded many details of French Pharmacy which would have added to the practical value of this essay; but on examining my notes, now after the interval of six months, I regret to find that many of the most important facts, by being intrusted to memory alone, have been rendered too vague and inaccurate for use.

A beautiful steam engine and boiler are among the most conspicuous objects on entering the manufacturing department; these are used both for the application of heat and for power, for the former, steam jackets surround the copper pans, digesters, syrup kettles, stills, &c.; for the latter, a shaft communicates with a variety of apparatus for comminution, stirring, &c. The mills seem adapted to the preparation of only a limited number of products used extensively in Hospital practice, and not so perfectly prepared elsewhere. For dividing certain herbs and roots for infusion, a pair of cylinders rotating in the same direction, serve to pass the drug in thin layers on to a horizontal surface against which a sharp knife edge impinges so as to cut them with a clean smooth edge.

Another form of mill designed for crushing drugs consists of four horizontal iron cylinders, set in a frame, with a slide for regulating their distances apart; one pair of these is rough and the other smooth; the drug, which must not be too coarse, is passed in through a hopper. This apparatus, with a sifting machine and appropriate seives, serves to prepare flaxseed for

use in cataplasm, a very important item in the Pharmacy of the Hospitals. As the proper composition of Cataplasma Lini has been a subject of some discussion in our pharmaceutical bodies, I was curious to know the practice of the French Hospitals, and on enquiry was informed that flaxseed is prepared in rather coarse powder, by passing successively between the rough and smooth cylinders, and that the so-called *cake* of commerce, flaxseed deprived of the oil, is reduced to a much finer powder; these are then mixed in the proportion of one part of the fine cake meal, and two parts of ground flaxseed, to constitute the material for poultices; mixed with certain proportions of mustard flour, the same materials are used for sinapisms.

Among the mechanical contrivances worked by the steam engine, my attention was arrested by one for crushing almonds, which consists of two stone cylinders moving almost in contact with each other, and reducing the almonds to an oily pulp; for obtaining the fixed oil this is subjected to the powerful action of a hydraulic press. When designed for orgeat syrup the almonds are previously blanched by maceration in water and handling, as with us, a matter of no slight labor when we consider the very large quantity of this syrup consumed in French practice.

An enormous quantity of simple syrup is manufactured at the *Pharmacie Centrale*, and the apparatus for its preparation is a prominent feature in the establishment. The syrup kettle, which is of copper, has a capacity of perhaps over a hundred gallons, it is heated by steam, and of course the sugar is dissolved with perfect facility. The arrangements for drawing it off and refrigerating it are complete; as the immense body of syrup would be very long cooling and would be troublesome to transfer to suitable vessels for preservation and distribution, a tube of considerable capacity is arranged to pass to the bottom of the syrup kettle; this is connected with a force pump by which the syrup is pumped through a coil of pipe immersed in a refrigerating tube, from which it runs into a series of cisterns from which it can be conveniently drawn by cocks. The syrup kettle is charged three times a week, so that these cisterns require to be of considerable capacity to provide for the occasional surplus of supply. In a large conical bag adjacent to the series of pans

and syrup kettles, I observed a quantity of sarsaparilla syrup slowly filtering through animal charcoal, a process which I believe is unknown among us.

In one of the large jacketted pans was a mass of Iceland moss paste, a preparation very unlikely to be introduced into an English or American Hospital. In another was an enormous quantity of simple cerate in process of preparation, from yellow wax and olive oil; the wax being previously strained and run into squares, forms a pure and smooth cerate requiring no straining. Blistering plaster is supplied to the Hospitals in the form of a *tisane*, ready spread for use; it contains the powdered cantharides, and has exactly the right consistence to adhere at the temperature of the body.

Among the more strictly chemical processes, that for preparing carbonic acid water for the Hospitals, was among the first to arrest attention; the gas is liberated in a glass bottle, from which it is discharged by a bent tube into a common gas holder, thence by force pumps it is thrown into stationary iron fountains partially filled by means of another force pump, with water or with the medicated aqueous liquids required; from these fountains the surcharged carbonic acid water is drawn off into suitable bottles, through a bottling machine, and well corked for distribution among the several Hospitals in which this refreshing drink, variously modified by medicinal agents, is quite an important article.

The apparatus for Quevenne's iron consists of two mercury bottles placed in a perpendicular position in a charcoal furnace, the pipes from the hydrogen generator and for the discharge of waste gas and vapor of water being joined by screws to the top and bottom; six pounds is produced by one charge. Kermes' mineral was in course of preparation by the carbonate of soda process; it is one of the leading articles of their manufacture. Fuming nitric acid is produced to supply their own demand, being distilled in the usual way by use of a glass retort. Calcined magnesia is produced from the carbonate, which they prefer to purchase, by disposing four or six pots, in a common furnace, one upon another, each nearly filled, and the upper ones having small holes drilled in them. In every process that we observed, there was evidence of a skill and neatness of manipula-

tion, in keeping with the elegance of the apparatus and the liberal provisions of this noble Government Institution.

Somewhat similar in its plan of operations to the Phamaceutical manufactory just described, is the *Pharmacie Centrale des Pharmaciens* in the Faubourg St. Germain, Paris; this is the property of a Stock Company, and is under the superintendence of M. Dorvault, a pharmacien of eminence, somewhat known in this country by his work entitled, *L'Officine;* it is a general manufactory of chemical and pharmaceutical products, which are sold to the trade exclusively by wholesale. Although less prepossessing in its situation and external appearance, this establishment is the scene of a much greater variety of pharmaceutical operations than the foregoing, and if thoroughly explored, note book in hand, would afford a still larger fund of pharmaceutical information; as my opportunities for observation were limited, owing in part to the absence of M. Dorvault, in attendance upon a Pharmaceutical Convention at Rouen, and in part to the pressing nature of the business of the establishment, which seemed completely to occupy all its employees, and above all, as I have fully reached the limits I had allotted to this essay, I shall close without attempting the meagre notice which my opportunities would allow of this, the original source of a large share of those preparations, which, marked with the names of the numerous eminent French Pharmaciens, reach our country, and add to the variety upon our shelves. Taking leave of Paris, I would also take leave of the kind reader, with whom it has been my desire to share in some degree the pleasures and advantages of my transatlantic wanderings.

ON THE PRESERVATION OF FLUID EXTRACTS.

By Henry Thayer, M. D.

An article in the last number of the Journal of Pharmacy on the above named subject, having taken for its text a paper that I read before the American Pharmaceutical Convention, I avail myself of a few moments leisure to pay it some attention, as the conclusions arrived at, although in some respects similar to my own, do not seem to be warranted by the course of reasoning.

If the writer confounds me with those who strive to prove that strong alcohol is the great and only extracting and preserving menstruum, I can only say that he i smistaken ; that I have rather preferred to avail myself of established scientific principles, to building up new and doubtful theories. In my paper I said nothing concerning the practical application of my ideas, merely considering the abstract value of two substances as preservative agents. In an article written and published last year, I recommended the use of both sugar and alcohol in fluid extracts, remarking that sugar "assists the solution of the precipitates and disguises the disagreeable taste of many extracts." I advocated the use of alcohol, because I believed with the writer of the article, that it effectually counteracts fermentation and mould, and because I did not believe with him that in fluid extracts it is liable to acetous fermentation. Let it be understood, that in speaking of sugar as not a safe preservative, I refer to purely saccharine extracts. If the partial employment of alcohol is allowed, there can be with me no controversy.

The article starts with a proposition which is fatal to the use of sugar as a preservative. In substance it is this; that if the alcoholic principles of a plant are insoluble in water or a solution of sugar, the latter as a menstruum is inadmissible.

Sugar aids the solvent power of water, but this aid is not afforded in sufficient degree to dissolve the alcoholic principles which exist or should exist in concentrated fluid extracts. It is enough to point to the cincho-tannates from calisaya bark, to the resins of mandrake, cannabis indica, jalap, to the principles which, although evaporated in vacuo, we find abundantly deposited from henbane, foxglove and other narcotic plants, to lupulin from hops, and to the many principles, not understood, which alcohol extracts from all or nearly all other plants. These precipitates are not due to the absorption of oxygen ; they are not apotheme. They deposit the same when evaporation is conducted in a vacuum. They are medicinal principles, deposited because the menstruum loses its power of solution in consequence of the evaporation of alcohol. I believe that the instances are very rare, where the alcoholic or hydro-alcoholic principles of any root, bark or leaf will dissolve in a solution of sugar, in the proportion of one pound of raw material to the pint of liquid,

without more or less precipitation. It is true that close flannel will strain out these principles, but the resulting preparation will not be of much worth. If they are suspended only, they are "sure to separate, and thus detract from the nicety of the preparation."

I find on the next page an admission of importance, it is this: that a certain proportion of alcohol tends to prevent and arrest vinous and acetous fermentation and that we know so little concerning "natural ferment," as I called it, that in nearly all cases we are "deprived of the means for removing it." Farther on the subject of fermentation is again alluded to, but only to remark, that "the necessary quantity of sugar will counteract it," while alcohol will not do it, because alcohol has "a tendency to undergo acetic fermentation through the influence of sundry vegetable substances." Although the subject of fermentation is thus lightly passed over, I deem it one of some importance, and worth looking at for a moment.

"Natural ferment" does its work independently of oxygen. Vinous fermentation will occur equally well in closed or open vessels. Sugar is food for fermenting substances to consume, the only substance which this ferment will infect, while alcohol kills its action and stops all the phenomena of vinous fermentation. But it is said, that "the necessary quantity of sugar" will accomplish the same end. Not entirely. The variations of temperature, whether induced by changes of weather, seasons or climate, which occur, either induce fermentation directly, or by first inducing crystallization, that chief enemy," indirectly give the exciting substance a chance to act. I do not see how difference in the solubility of sugar in water caused by variations of temperature occurring at different seasons, can be a more serious objection than fermentability, when the latter is a direct effect resulting from the former, nor do I see why difference of temperature arising from different seasons is a serious objection to the use of sugar, when an argument founded upon the same variations resulting from difference of climate, is pronounced untenable. If these variations of temperature affected only the specific gravity of solutions of sugar, we should hear very little about them; it is the effects following this difference in specific gravity that we fear.

The laws which govern vinous and acetous fermentation are entirely different. The former is easily excited and rapid in its operation; the latter is hard to excite and slow in its operation; the former proceeds without the aid of oxygen; the latter consumes large quantities of oxygen. Vinous fermentation is easily induced in closed vessels, acetous fermentation requires free and continued exposure to the air, and a ferment differing in nature from that required for the former. Acetous fermentation occurs in syrups and saccharine fluid extracts, but here it must be preceded by the vinous. I think then, that the natural change of sugar which takes place *without* oxygen is more to be feared than the natural change of alcohol which *requires* oxygen.

The writer differs from my opinion that saccharine fluid extracts are more liable to undergo fermentation than officinal syrups, because "the nearer the density of organic matter approaches solidity and dryness, the less is its proneness to undergo such a change." Unfortunately, the directions for using sugar in fluid extracts do not point to any nearer approach to solidity. From twelve to fourteen ounces troy of sugar, and the contained vegetable matter, form a fluid extract that "will generally be nearly of the density of our ordinary syrups," the theory being, I suppose, to approach as nearly as possible to the specific gravity 1.319 in both preparations. In syrups there is more sugar and less vegetable matter; in saccharine fluid extracts there is less sugar and more vegetable matter.

But there are changes other than acetous fermentation produced by oxygen in vegetable matter. This is illustrated by the deposits which occur in officinal tinctures. These deposits, it is argued, are due to the natural absorption of oxygen by alcohol. Not entirely. They are owing in as great a degree to the natural evaporation of the alcohol, which, lowering the percentage of the menstruum, and in consequence its power of solution, allows a part of the contained matter to fall. The article allows that greater changes would take place if water was substituted for alcohol; so would greater changes take place if for alcohol solution of sugar was substituted. "The decomposition would have been in another direction," a quicker and more fatal one. The real advantage in using alcohol as a menstruum,

is not that by it two or three ways of decay are excluded; an equally important advantage is that by its presence, in greater or less proportions, valuable medicinal principles are obtained that otherwise would not be extracted.

Iodide of iron possesses no qualities calculated to produce changes in a solution of sugar; it belongs to the mineral kingdom. Let us take an illustration from the vegetable kingdom. Saussure found that during twenty-eight days, oil of lemon absorbed each day twice its own volume of oxygen. To this absorption is due its proneness to change. If to one fluid pound of simple syrup we add one ounce of fresh oil of lemon, and to one fluid pound of alcohol we add one ounce of the oil, which menstruum will longest preserve the oil from change?

Although the use of essential oils to improve the flavor of fluid extracts may be admissible, I do not see how they can be called "antiseptics similar to alcohol," when they so easily and rapidly undergo change by absorbing oxygen, and do not act by abstracting moisture from membranes and all similar substances."

There is no better illustration of the subject of transparency in fluid extracts, than the cincho-tannates already alluded to. In making fluid extract of calisaya bark, these principles are copiously deposited during evaporation, neither water or sugar will dissolve them; by the use of close flannel we lose them, but the presence alcohol in proper proportion dissolves them. I believe this to be a speaking example in favor of the employment of alcohol.

Recapitulating the points treated on, the article gives the following as the sixth reason to prove "the superiority of sugar over alcohol." "By the addition of a slight quantity of alcohol when necessary, the tendency to fermentation and moulding will be effectually counteracted." Exactly.

It may be that in some instances where, from the nature of the case, a formula cannot be devised which will at all times and seasons be applicable, a departure therefrom may be justifiable, but to allow such departures can hardly be safe, as a general rule. Fortunately, in the case of fluid extracts, no such difficulty exists, as formulæ can be adopted which will be universally applicable.

Before concluding, allow me to remark that the value of experiments in chemistry or pharmacy is not affected by the locality which originates them. An eastern, western, northern or southern location does not add to or detract from one jot or one tittle of their value. The skill with which they are conducted and the truths which they develope are all that is to be considered. Experiments to prove theoretical reasoning are seldom so valuable as experience gained in conquering difficulties occurring in practice.*

Cambridge, Mass. March 31, 1859.

* Note. Since reading Mr. Thayer's paper, we have carefully reperused that of Mr. Maisch, to which it refers, and do not think that the latter had in view any particular writer or manufacturer, but addressed himself to the subject itself, in doing which he necessarily had to allude to those who had written upon it. It struck us that Mr. Maisch's paper was unusually free from prejudice. What it needed was an acquaintance with the actual changes that occur in concentrated tinctures, or fluid extracts, such as Mr. Thayer prepares, and which he had not an opportunity to gain. The best place to derive this knowledge would be at an agency of the manufacturer, where a stock of all kinds is kept, and there inspect the unopened bottles as they are offered to the trade. A hasty examination of a variety of alcoholic fluid extracts, at an agency in this city, resulted in finding at least two-thirds of them with sediment, in variable quantity. We confess that after reading all that has been written, that we incline to the opinion that the preservative agent will have to vary in kind and properties to suit the circumstances of the case, and that an attempt to use only alcohol or only sugar will result in disappointment, either pharmaceutically or therapeutically.

In considering the changes which these preparations undergo by age and exposure, it is necessary to study the composition of the soluble matter of each drug, and the tendency to a disturbance of solubility by the mutual reaction of the contained principles. Let us instance what we mean in a familiar example. It is now pretty generally conceded that the resins and crysophanic acid in rhubarb are largely concerned in the cathartic power of that drug, although its collective medicinal power includes other principles. If we make a watery infusion of rhubarb, it will be found that these principles, almost insoluble in water in an isolated state, are found in solution, through the aid of associated substances, just as insoluble cantharidin is naturally soluble in water, as it exists in the fly. If we treat coarsely powdered rhubarb by direct percolation with alcohol of 70 per cent., we easily get a concentrated solution of all that is soluble in the drug, desirable to be extracted. If now, we concentrate this carefully by

evaporation, it may reach a syrupy or extractive consistence without any loss of transparency, or separation of solid matter: and if before all the alcohol is dissipated, we add sugar in the proportion of ten ounces to the pint of the resulting fluid, we obtain a perfectly transparent extract which retains its clearness, though devoid of alcohol; yet if it be mixed with water, an immediate opacity occurs from the precipitation of resinous matter.

On the other hand, the officinal tincture of rhubarb gradually lets fall a deposit, which Messrs. De la Rue and Muller have recently shown to consist chiefly of crysophanic acid and the three resins of rhubarb, notwithstanding the menstruum is diluted alcohol. What is thus true of rhubarb applies to many other drugs, yet it will not do to infer that because sugar is a good agent for fluid extract of rhubarb, that therefore all others must be similarly preserved. On the contrary such substances as cimicifuga, jalap, podophyllum, etc., should either possess a highly alcoholic menstruum, or contain an alkaline solvent. The question to be resolved is, can we make fluid extracts that contain all the valuable ingredients of drugs, that are capable at the same time of resisting the mutual reaction of their proximate principles, and such external agencies of deterioration as heat, light, and oxygen, and thus be entitled to the character of permanent preparations; or must we, after all, class them with those preparations which should be kept but a moderate period, and prepared in quantities to suit the demands of the dispenser? That we may be able to arrive at this desirable knowledge, let the brethren south and north, east and west, give the results of their experience as regards the permanence or changeableness of the products now in use, as well as in the study of the subject in new aspects.—Ed. Am. Journ. Pharm.

NOTE ON PROPYLAMIN.

By William Procter, Jr.

Since noticing this substance in the March number, I have made an experimental essay in obtaining it for medicinal use. One quart of herring pickle obtained from the *top* of the barrel, was mixed with an excess of liquor potassæ and distilled in a large flask attached to a condensing arrangement. The receiver contained distilled water slightly acidulated with muriatic acid. The process was continued until a pint of distillate was obtained, the contents of the receiver being kept slightly acid, by adding diluted H,Cl from time to time. The distillate was now evaporated carefully until indications of crystallization were noticed, when it was set a side to cool. The mother liquid,

by further evaporation, yielded another crop of crystals—nearly as white as the first, making about half a drachm in all. It is probable that the pickle, taken after the herring have been removed, so as to have been more in contact with the fish, would contain a greater amount of the alkaloid. The best way to prescribe propylamin will probably be as a chloride, so as to avoid loss by evaporation, and its disagreeable odor when in a free state. After solution in water, the addition of an equivalent of liquor potassæ will liberate it if desired. But should it be considered preferable to have the alkaloid itself, the chloride, placed in a small retort, with sufficient liquor potassæ to disengage the propylamin, will yield that principle to distillation, using an apparatus, close joints and thorough refrigeration.

The salt as thus obtained is perhaps sufficiently pure for medicinal purposes, but it may contain a little muriate of ammonia, from which it may be freed by solution in strong alcohol and recrystallization.

STEAM APPARATUS FOR PHARMACEUTICAL PURPOSES.

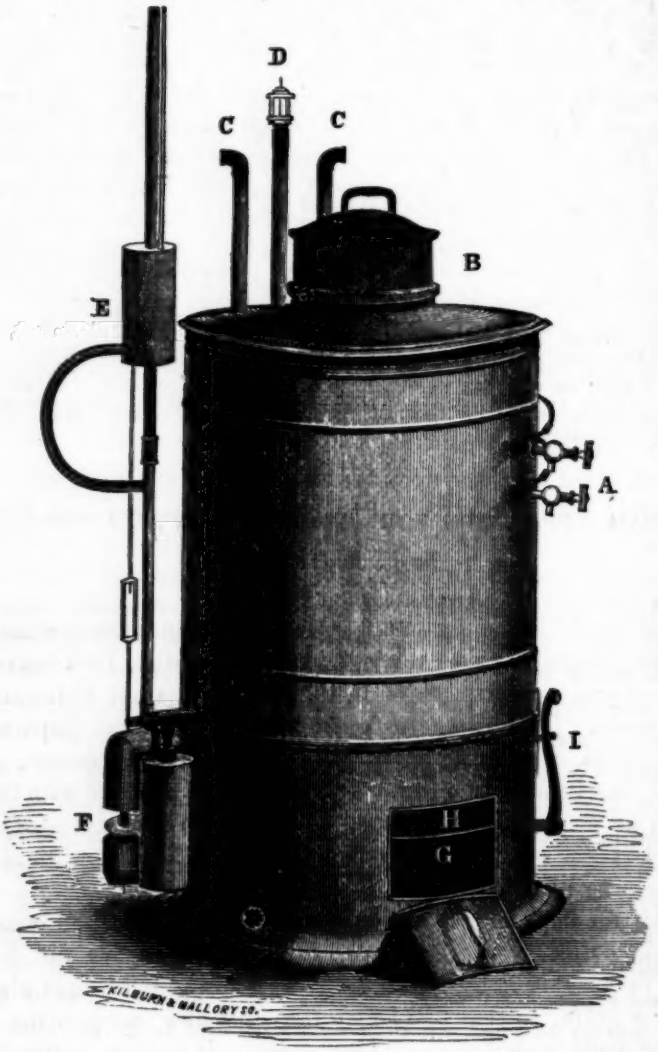
By J. R. Nichols.

To the Editor of the American Journal of Pharmacy:

Having devised a steam apparatus, which answers so admirably the purposes of the chemist and pharmaceutist, I am induced to send you a description of it, together with a cut illustrating the same. The apparatus is automatic in several important particulars, regulating its air draft, and steam pressure, and supplying itself with water. It also feeds its own fire with fresh coals as combustion proceeds, so that it is only necessary to supply them once in twenty-four hours. The cut will aid in explaining its construction.

An annular boiler is placed in a vertical position, and encased within cylinders of sheet iron, so as to afford space for draft, and for insulation by confined air. Its lower opening is placed over a grate, so that the boiler forms its own fire pot, the fire being built within the annular space. It is thus made very efficient, without the annoyance and expense of tubes, and there is no obstruction of flues. The boiler may be made of iron or copper. The door which is shown as removed, covers two open-

ings; the lower opens into the ash chamber, below the grate; the upper, into the space around the boiler, so that if the ash door is accidentally left open the draft is checked and no injury can



result. The apparatus is air tight, the open valve upon the left affording the only ingress of air to support combustion. This vault is opened and closed by steam pressure in the following man-

ner: When the steam begins to form in the boiler, it presses upon the water and forces it out and up the open tube connecting with vessel *E*. As it rises, it also passes through the flexible pipe attached, and flows into vessel *E*, when by its weight it passes down the spiral spring and closes the draft valve at *F*. This checks combustion, and consequently the formation of steam and as steam pressure diminishes, the water in the tube falls and passes out of vessel *E*, and the spiral spring raises it and opens again the shaft. Thus, steam pressure perfectly controls combustion. If but little steam is used, but little fuel is consumed. The vessel *E* is placed thirty-four inches above the water level in the boiler, thus allowing just one and a half pounds pressure to accumulate, before the draft is checked. This pressure is sufficient to force the steam through six hundred feet of pipe with facility. The tube upon which it slides is open constantly, so that if the safety valve and air draft both become obstructed all the water will flow out of the boiler, at three pounds, thus making explosion impossible.

Fuel is fed into the cylinder at the top of the apparatus by removing the cover. It holds a supply for twenty-four hours, and as it is consumed below, it falls down to the fire by its gravity.

The arrangement for feeding water is exceedingly simple and effective; it is not clearly shown in the cut. But little water is required except when the process of distillation is going forward, as the steam is condensed in the retorts, evaporators, radiators, &c., and returns to the boiler again through the same pipes that convey it away. *D* is a safety valve lifting at one and a half pounds. *C C* are pipes for conveying steam. *A*, steam and water cocks. *I*, handle for grate. The apparatus is portable, and may be placed in a basement, or in the laboratory of the pharmaceutist. One has been in use in my laboratory for many consecutive months, without any disarrangement or instance of failure. By connecting radiating coils, it is made to do the work of warming the building in addition to its other duties. Broad jacketed pans of tinned copper are used for evaporations. The steam is let in at the bottom through an inch coupling, and as it condenses it flows back again to the boiler. The heat is controlled perfectly by an air cock attached to the pan, so that any temperature between 100° and 212° F. may be maintained.

It cannot rise much above that point, but that is sufficient for quite dense liquids. The retorts are also of copper and jacketed, with the exception of that for spt. etheris nitrici, which is of lead, and heated by a coil in the interior. The temperature is easily and perfectly controlled; the apparatus is well adapted for the perfect production and distillation of this ether. A much higher temperature is required for the manufacture of sulphuric ether than can be attained by its use. For all the purposes of drying, distilling, evaporating, warming, &c., nothing can more convenient, safe, and economical. It meets the requirements of sand baths, water baths, distillatory apparatus, dryers, &c., and will warm the establishment of the chemist and pharmaceutist, at the same time. The amount of coal consumed depends of course upon the work done. But I have found fifty pounds in the twenty four hours to be sufficient for constnt use in the laboratory, and for heating the rooms.

Boston, Mass, April 5th, 1859.

NOTE ON THE KINO OF EUCALYPTUS RESINIFERA.

By William Procter, Jr.

Some time ago, Dr. Wood, when preparing the last edition of the U. S. Dispensatory, placed in my hands for examination a sample of Botany Bay kino, accompanied by a twelve ounce bottle of the juice of the Eucalyptus resinifera, from which it is produced. A condensed statement of the results of its examination will be found in a note at page 454 of the 11th edition of the Dispensatory, (1858.)

These specimens are entirely authentic, having been brought to New York directly from Australia, and presented to Dr. Wood by Mr. S. W. Osgood, druggist, of the former place. The examination made for Dr. Wood, only had reference to the kino itself, the drug he was describing, but it has occurred to me that it may be of some interest to extend the inquiry to the juice itself, as regards the proportion of solid matter it contains, its astringency, and other properties, and offer it in a short note.

The Kino.—This consisted of the extract proper mixed with

pieces of a very loose textured brown bark to which the kino was adherent, as though, in removing it from the tree on which the juice had hardened, the bark adhered to it. Much of the kino was broken up into grains and small particles of the bark interspersed. The fragments when held to a strong light are translucent and of a garnet color, their taste is astringent and bitterish with a slightly sweetish fore taste. It has no odor. The grains are very friable and easily reduced to powder of a light mahogany color. The action of water on the powder is peculiar; the greater part of it coalesces by contact with that fluid into a soft mass of putty-like consistence; by continued malaxation with water it yields 67 per cent of its weight to that fluid, and probably more of it would have dissolved by continuing the process. The undissolved residue consisted chiefly of apotheme, soluble in alcohol and alkaline liquids and resulted probably from the action of the air.

The slowness of action of water upon this kino will probably account for some of the discrepancies which exist in the results of other investigators, who have stated its solubility in water as varying from 17 per cent. to entire solubility except impurities.

This kino dissolves entirely in alcohol sp. gr. 835 with the exception of impurities. On diluting the tincture with water no change in its transparence occurs at first, but on standing, a slight flocculent precipitate occurs. This result would seem to indicate that nearly the whole of the kino might be dissolved by water if time enough was given.

The following chemical reactions were obtained with the aqueous solution. Lime water caused a fawn colored precipitate. Sesquichloride of iron a greenish black precipitate, which separates and leaves a clear greenish liquid; gelatin causes an abundant flocculent precipitate; sulphate of copper produces a light gray deposit; corrosive sublimate a cloudiness, tartar emetic a fawn colored precipitate depositing slowly from the water.

The Juice of Eucalyptus resinifera was in a twelve ounce bottle tightly corked and sealed. It was perfectly transparent, of a deep red brown or dark wine color, and adherent to the bottom was a small portion of transparent solid matter, evidently deposited from the juice. On opening the bottle, the liquid

was found to possess a slight peculiar odor somewhat like must. Its consistence is like a mixture of one part of syrup with two of water, its specific gravity; is 1.048. When it is evaporated to dryness it yields 13 per cent of extract similar in appearance and taste to the kino. Its taste is strongly astringent, followed by a sweetish rather unpleasant impression that recalls the odor of the juice. When heated to ebullition the fluid remains perfectly transparent; when mixed with three times its bulk of water it becomes cloudy, but does not immediately precipitate; on heating gently, transparency is resumed, to again cloud by cooling; a little alcohol renders it permanently transparent.

When the juice is agitated repeatedly with ether, it communicates its color to that fluid, and on evaporating the ether, a small quantity of soft red extract results, astringent to the taste, and striking a greenish black color with sesquichloride of iron.

With reagents, this juice behaves much as the aqueous solution of the kino; it is precipitated abundantly by gelatin, acetate of lead, and lime water. Tartar emetic and corrosive sublimate, each precipitated it, and the persalts of iron strike a dirty greenish black color. Neither liquor potassa nor ammonia cause any cloudiness, but darken the color of the aqueous solution. Dr. Pereira believed that Botany Bay kind contains, besides tannic acid, a peculiar pectin-like body, which he has called *eucalyptin*. He indicates eucalyptin by its property of being precipitated from the alcoholic tincture of this kino on the addition of ammonia, or solution of potassa. When half a drachm of the juice was diluted with two drachms of alcohol, the solution was precipitated by both ammonia and potassa, of a dark brown color—corroborating the observation of Pereira.

As the specimen of Eucalyptus juice above described is several years old, and does not exhibit the slightest indication of decomposition, there can be little doubt of its being a valuable astringent medicine where it is within the reach of the physician. It is quite probable, however, that if exposed to the action of the air, it would gelatinize and lose its astringency, as its tannic acid appears analogous to that of the Pterocarpus erinaceus.

GLEANINGS FROM THE FRENCH JOURNALS.

By the Editor.

On the vermifuge properties of Ailanthus glandulosa, of China.—This tree, so well known in the United States as a shade tree, and recently so much decried, owing to the strong peculiar odor of its flowers, is the subject of a notice in the *Journal de Pharmacie* for March, by Prof. Hetet of the Ecole de Médicine of Toulon. This tree, which belongs to the natural family Xanthoxyleæ and allied to the genus Rhus, is also identical or closely related to the Japanese Varnish tree, and within a few months has acquired more importance in view of its leaves being used as food for a species of silk worm, Bombyx cynthia, which has recently been introduced into France.

If a piece of the bark of *Ailanthus* is chewed, it gives a decided bitter taste, and soon after a general unpleasant feeling, accompanied by nausea and prostration, similar to that derived from tobacco by novices, or from henbane. These physiological effects seem to have given rise to the term *caco dendron* (Ehrh.) formerly given to the tree.

These qualities induced the author to enter on an investigation of its effects on animals, and to analyze it, but he afterwards ascertained that M. Payen *Annals de Chimie* t. xxvi. p. 239, had already given an analysis—in which it appears to contain lignin, chlorophylle, yellow coloring matter, pectin, bitter substance, aromatic resin, traces of volatile oil, nitrogenous matter, and some salts.

The powdered bark has a greenish yellow color, and when recent has a strong virous odor and very bitter taste. The coloring matter is not valuable as a dye. The pectin is very abundant. By treatment with alcohol, the resin, volatile oil and bitter principles are dissolved, and on evaporation a soft, oleo resinous extract, strongly odorous, is obtained.

M. Hetet has experimented therapeutically and physiologically with the powder, aqueous alcoholic extracts, and oleo resin on dogs. All have proved successful, that is to say, in all cases they have produced abundant stools, with the expulsion of tænia.

The powdered bark was given in doses of 8 grains; the aqueous extract, in doses of four grains, and the oleo-resin in three grains. The pure resin proved purgative in six grain doses, but did not expel worms. The author attributes the prostrating effects of the bark to the volatile oil, as the resin did not produce them. The effects of this oil is so decided that an assistant charged with evaporating the extracts has been seized with vertigo, cold sweats, and vomiting every time he neglected the precautions adopted to avoid the vapors; and the author himself had experienced them to some extent, from similar emanations, and he also had observed the effects of the extract on a dog, accidentally taken.

Being satisfied of the emetico-cathartic and anthelmintic power of the ailanthus, the author sought to verify it in practice, and gives several cases in point.

1st. F——, a laborer in the arsenal, having sharp pain in his left side, stomach and abdomen, was examined in reference to the debris of tænia, and evidence of their existence noticed. The usual vermifuges, such as pomegranate bark, castor oil, etc., did not relieve him. The powder of ailanthus having been prescribed at the instance of the author, soon expelled several fragments, and another dose of a gramme (15½ grains) relieved the patient of the worm, four and a half yards in length, including the head.

Returning to the hospital ten weeks after for another affection, he states on enquiry that it had not returned since.

2d. The Abbe L—— having noticed portions of tape worm came to the hospital, and under treatment considerable portions of the worm were expelled, but he became impatient and left before he was cured.

3d. L——, aged 49, a cooper by profession, had long suffered from the tape worm, and exhausted the nostrums of charletans. He took the powder of ailanthus, alternately with castor oil and glauber salts, during several days, the dose varying from 12 to 30 grains. After 15 days treatment the patient passed a complete worm 5½ metres (18 feet) long.

The author believes that the ailanthus has also febrifuge properties, and that its administration is entirely safe.

Carapa touloucouna is the name of a tropical tree growing in Guiana, the bark of which has recently been investigated by M. E. Caventou (Journ. de Pharm. Mar. 1859.) This beautiful tree attains the height of 70 to 80 feet, and from three to five feet in diameter. It belongs to the natural family Meliaceæ. Its bark is in pieces from 6 to 10 inches long, 1½ to 3 inches wide, and about 4 lines thick. Its external surface is deep gray, rugose; the epiderm is removed in places, so as to show a reddish surface; on some specimens white lichinoid plates occur. The intermediate surface is yellowish, and perfectly smooth. When chewed it is bitter, and the author supposed it contained a febrifuge alkaloid, but he proved to be mistaken. The following is the result of his analysis:—1st, *Touloucounin*; 2d, soluble red coloring-matter; 3d, insoluble red coloring-matter; 4th, yellow coloring-matter, 5th, green fatty matter, besides gum, wax, traces of starch and lignin. Touloucounin is a bitter resinous substance, does not crystallize, has a slight acid reaction, insoluble in ether, very soluble in alcohol and chloroform, and but slightly soluble in water, requiring 1400 parts of this solvent. Its ultimate composition is C^{20} H^{14} O^{8}.

M. Caventou has suggested several pharmaceutic formula which are probably premature, in view of the fact that it has not been used sufficiently to develope its therapeutic properties.

Ethereal Oil of Horse-chestnuts (Marron d'Inde). M. Genevoix (*Bulletin de Therapeutique*) states that the ethereal oil of horse-chestnuts has been employed recently as a topical agent in the early stages of gout and rheumatism.

It is prepared, by percolating the feculent matter of the kernel of this seed with ether, which removes fixed oil, and by evaporation yields it ready for use. Ten kilogrammes of the chestnuts (21 pounds) yielded but ten grammes (2½ drachms) of the oil. This oil is applied to the part by means of a camel's hair pencil, several times over if the pain is severe, and the part then covered with wax-paper, wadding, or flannel, and the patient kept quiet. The dressing may be renewed two or three times a day.

New mode of preparing Medicated Suppositories, with butter

of cacao.—Dr. Pfeiffer (*Journ. de Pharm.*, Mar. 1859) recommends the following method of making suppositories. The butter of cacao is fused, run into conical moulds, and before cooling a piece of tube is inserted into the base of the suppository till the fat solidifies, when it is removed. The cavity thus produced is the receptacle for the medicinal matter, be it extract, powder, or liquid, which is then closed up with a portion of the butter softened for the purpose. The particular advantage proposed to be gained, is that the suppositories may be medicated extemporaneously.

Solubility of some Alkaloids in Chloroform.—M. Pettenkoffer (*Rep. de Pharm. Fevrier*, 1859) has determined the per centage of solubility of the following alkaloids in chloroform. 100 parts of the menstruum at the ordinary temperature dissolves of

Morphia	0.57
Narcotina	31.17
Cinchonia	4.31
Quinia	57.47
Strychnia	20.16
Brucia	56.70
Atropia	51.19
Veratria	58.47

Dentrifice.—M. Denique (*Journ. de Pharm. D'Anvers*) has given the following recipe for tooth powder, viz:—

Take of Bone phosphate of lime	150 parts.
Pumice stone	150 "
White Talc	250 "
Cream of tartar	100 "
Orris Root	80 "
Rose Pink (or lake in drops)	200 "
Ceylon Cinnamon	30 "
Calcined Alum	30 "
Essence of Bergamot	8 "
Essence of Cloves	2 "

Triturate carefully the lake and ground pumice stone till they are sufficiently divided; add then the powders of cream of tartar, orris root, etc., and lastly the talc; pass through a very fine silk sieve; the essences are added afterwards, and mixed by trituration.

ON THE MOST CORRECT METHODS FOR PREPARING EXTRACTS.*

By F. Vielguth, Jr., and Julius Nentwich.

The aim of the authors was to present in the form of extracts, all the soluble substances of the medicinal plants, to the exclusion of those which might have a deteriorating influence; this they believe to gain by the proper method of exhausting the plants, by the proper temperature during evaporation, and by the quickest possible dispatch of the work. The best form for keeping and preserving the extracts was to be inquired into, and the authors think the dry pulverulent state to be the most advisable to preserve extracts from the change induced in the presence of moisture and air.

As the exhausting menstruum, water is used for plants abounding in sugar, dextrin, extractive, tannin and bitter principles, and containing no resins, volatile oils or alkaloids insoluble in water; albumen and starch, if present, can be removed by maceration or cold displacement, and boiling of the tincture. Alcohol and water are used when principles are present which are soluble in alcohol; if exhausted by a boiling temperature, Mohr's apparatus (M. R. & Pr. Pharmacy, p. 264,) may be advantageously used, and the lower vessel be of tin. Alcohol alone is employed for the extraction of alkaloids, resins, volatile oils and bitter principles, not easily soluble in water; chlorophyll and vegetable wax detract from the virtue and stability of the extract, and are to be removed by the addition of some water to the evaporated tincture, and the employment of a weaker alcohol in the first place. Ether is used when it is a better solvent than alcohol.

To determine the quantity and quality of the narcotic extracts, prepared from the fresh and the dried herb, the following experiments were made:

* Prize essay to the question propounded by the Moravian Pharmaceutical Association, for 1857, as published in Wittstein's Vierteljahresschrift, 1858, p. 321–348 and 481 to 502. The essay was accompanied with specimens of all the extracts in form of dry powder of excellent quality. The above is a short abstract of that lengthy, very interesting essay.

J. M. M.

Of 20 pounds fresh herb of Aconitum Napellus, one half was dried at 30° C. (86° F.,) leaving 2½ pounds, which furnished 3¼ ounces extract; of the remaining 10 pounds fresh herb 4⅝ ounces extract was obtained in the same manner; but the extract from the dried herb contained 0.322 grms., the other only 0.202 grms. of nearly pure aconitine. It will, therefore, be preferable for pharmaceutists to prepare the narcotic extracts for their own use, as from good dry herbs they will be sure of obtaining a more active extract.

The quantity of the exhausting menstruum is a great object, as with an increase of it the solution must be exposed for a longer time to heat and air. But also the mode of extracting must be kept in view. Mohr's press box and his displacement apparatus are recommended for the various processes. For the cold displacement the authors have constructed a suction pump, which from the receiving vessel withdraws the air, so that the pressure of the atmosphere forces the liquid in the percolator through the finely powdered substance. Before evaporation the liquids are to be decanted or strained, by which precaution a burning of the extracts is prevented, and the liability to ferment lessened.

For the evaporation of larger quantities of liquids, the authors have constructed a peculiar apparatus, consisting of a copper boiler, into which a smaller copper kettle is fitted. Water is heated in the boiler and the steam passed under a well tinned evaporating trough; the liquid after having been heated in the kettle, is drawn into a reservoir, from whence it runs into the trough, which is divided by partitions running alternately from both sides of the trough, to within a short distance of the opposite side; the trough stands on an inclined plane, the lower end of which is by means of a pipe connected with the kettle. The advantages of this arrangement are, that the liquid is constantly kept in motion, the temperature never rises above 70° C, (158° F.,) and that by the continued evaporation the access of air is almost entirely prevented. For smaller quantities, porcelain evaporating dishes are used, heated by a water bath.

The authors distinguish four different degrees of the consistency of extracts: 1, consistence of *extr. graminis*, 1340 grs. of which fill a 1000 gr. flask at 14° C, (58° F.,) 2, consistence of

extractum taraxaci, spec. grav. 1.380, at 14° C; 3, consistence *of extractum radic. glycyrrh.* which is obtained by evaporating the liquid to the spec. grav. 1.090 at 14° C, pouring it into a tared evaporating dish, and evaporating it now to just one-fourth of its weight; 4, dry and in *form of powder.* Many extracts, like extr. hyoscyami, are hygroscopic in such a degree, that they cannot be kept in powder, or cannot be dried at so low a temperature as to preclude an injurious effect of the heat; they require the addition of an indifferent powder, and a number of experiments have convinced the authors that finely powdered liquorice root is preferable to any other substance. The extracts to be dried, when evaporated to the second consistence, are with constant agitation heated in a water bath to 60° C. (140° F.,) until they cease to lose weight; one-fourth of their weight of water or one-eighth of alcohol is then added again, well mixed and an equal weight of pulv. radic. liquir. alcoholis. stirred in, and the whole rapidly evaporated to dryness at 60° C.; 2 grs. of this contain 1 gr. pure extract. For pills or powders these extracts may be used as they are; for mixtures, straining is necessary after their solution; for ointments they are dissolved in four parts of water, strained and evaporated to two parts; repeated trials have convinced the authors, that this manipulation requires no more time than the cold dissolving of the extracts before their admixture with the ointment. The following extracts can be kept in powder without any addition: Extr. cascarillæ, chamomillæ, cinchonæ fuscæ, colombo, guaiaci, juglandis, millefolii, quassiæ, ratanhæ, salviæ, tormentillæ. The following require the addition of powdered liquorice root: Extr. absinthii, aconiti, acori, angelicæ, arnicæ, belladonnæ, cardui bened., centaurei min., chelidonii, cichorei, conii, digitalis, dulcamaræ, filicis maris, gentianæ, hæmostaticum, (ergotæ Bonj.,) hyoscyami, hellebori nigri, lactucæ virosæ, mezerei, nucis vomicæ, saponariæ, sarsaparillæ, scillæ, trifolii fibr., valerianæ.

To arrive at reliable results, the authors employed the same quantity of menstruum, for preparing the same extract by the process of decoction, infusion or percolation, and evaporated all extracts to dryness, the only reliable standard for comparison.

Table I.

Embraces the results from those plants which are best extracted by water; the column marked A, contains the officinal names of the extracts; B, the names of the plants; C, the time of their gathering; D, the weight from one thousand parts of the fresh plants, dried at 30° C.; in the cas eof extr. cichor. and tarax., the first numbers are the results from the roots, the second from the herbs; E, the quantity of water in thousands employed in each experiment for one thousand parts of the dry plant. The following columns contain the quantity of powdered extract obtained from one thousand parts of the dry plant, extr. cichor. and tarax. from equal weights of the root and herb: 1, by maceration; 2, by infusion for twenty-four hours; 3, by two decoctions; 4, by cold displacement, extr. card. ben., liquir. and ratanhæ, with the employment of the suction pump.

A.	B.	C.	D.	E.	1	2	3	4
Ext. Card. bened.	Centaurea benedicta, *L.*	before flowering	180	18	219	240	261	230
" Cent. min.	Gentiana Centaureum. *L.*	while in flowers	330	12	215	136	149	
" Cinch. fusc.	Cortex Cinchonæ Loxæ.			18	93	105	122	80
" Cichorei.	Cichoreum intybus, *L.*		281 156	12	245	214	209	
" Dulcamaræ.	Solanum dulcamara, *L.*	fall	352	12	109	107	101	
" Gentianæ.	Gentiana Pannonica, *Scop.*	fall	143	12	262	283	193	
" Graminis.	Triticum repens, *L.*	spring	204	8	220	229	230	204
" Liquir. liquid.	Glycyrrhiza glabra, *L.*	fall	367	10	127	200		174
" Quassiæ.	Quassia amara, *L.*			8	43	45	55	
" Ratanhæ.	Krameria triandra, *R. & Pavon.*			10	97	101	113	98
" Rhei Russ.	Rad. Rhei Russici.			12	306	312	262	
" Saponar.	Saponaria officinalis, *L.*	spring	171	12	364	343	179	
" Scillæ.	Scilla maritima.			10		159	230	
" Taraxaci.	Leontodon Taraxacum, *L.*	fall	278 187	8	402	374	307	
" Torment.	Tormentilla erecta, *L.*	spring	282	10	107	229	253	
" Trifolii fib.	Menyanthes trifoliata, *L.*	before flowering	172	12	178	205	270	

Centaurea benedicta contains much sulphate of lime, which must be separated by decantation before finishing the extract, which in one ounce contains one drachm of nitrate of potassa. Extract. gentianæ ought to be re-dissolved, filtered, and again evaporated, on account of the pectin. Extract. glycyrrh., prepared by infusion, keeps in the dry state unaltered without any addition. Extract. ratanhæ, prepared by displacement with the suction pump, is entirely soluble in water, the residual root yielded to boiling water 62.5 parts of dry extract, the greater part of which was insoluble in water. On account of pectine, the preparation of extr. rhei, by cold percolation is preferable.

Table II.

Embraces the extracts which are prepared by means of alcohol and water, the columns correspond with the former, E, containing the quantity of alcohol, spec. grav. .863, and water in thousands, their proportion in all cases being 1, 2; column, 1, the results of digestion for twenty-four hours, at 30° C.; column 5, the results by cold percolation with the aid of the suction pump.

A.	B.	C.	D.	E.	1	2	3	4	5
Extr. Absinthii,	Artemisia Absinthium, *L.*	flow. comm.	156	4:8	259	303	324	270	207
" Acori,	Acorus Calamus, *L.*	late in fall	157	3:6	140	145	155	143	200
" Angelicæ,	Angelica Archangelica, *L.*	early spring	187	3:6	270	328	345		170
" Arnicæ radic.	Arnica Montana, *L.*	fall		3:6	130	150	163	136	139
" Cascarillæ,	Croton Eleuteria, *Schw.*			2:4	79	88	101	95	100
" Chamomillæ,	Matricaria Chamomilla, *L.*	the flowers	186	6:12	137	252	282	149	158
" Colombo,	Menispermum palmatum, *L.*			3:6	220	253	345		264
" Guaiaci lign.	Guaiacum officinale, *L.*			2:4	56	68	77	48	56
" Hellebori nigr.	Helleborus niger, *L.*	fall	318	2:4	37	49	55	38	
" Jugland. nuc.	Juglans regia, *L.*			4:8	228	240	262		238
" Millefolii,	Achillea Millefolium, *L.*	flow. comm.	468	6:12	241	253	262		
" Salviæ,	Salvia officinalis, *L.*	flowering	156	5:10	172	216	230		212
" Sarsaparillæ,	Rad. Sarsap. Hondur.			3:6	116	112	133		
" Valerianæ,	Valeriana officinalis.	spring	185	3:6	112	224	233	199	230

For Ext. Sarsap. cold displacement is preferable, so as to leave the starch behind.

Table III.

Contains the results of the alcoholic extracts, the columns, A, B, C, D, as above, 1, 2, 3, the yield by digestion for twenty-four hours; 1, of 1000 parts fresh herbs; 2, of the same previously dried, with 1000 parts of alcohol each; and, 3, of 1000 parts dry herb with the proportionate quantity of alcohol; 4, by cold displacement of 1000 parts of dried herb with the employment of the suction pump, and 3000 parts alcohol of .863 spec. grav.

A.	B.	C.	D.	1	2	3	4
Extract. Aconiti,	Aconitum napellus, *L.*	before flow.	243	29	22	88	176
" Belladonnæ fol.	Atropa belladonna, *L.*	while flow.	176	52	33	186	221
" Chelidonii,	Chelidonium majus, *L.*	before flow.	170	25	31	181	
" Conii macul.	Conium maculatum, *L.*	before flow.	140	37		104	218
" Digitalis fol.	Digitalis purpurea, *L.*	commence fl.	133	28	18	137	271
" Hyosc. fol., 2 years'	Hyoscyamus niger, *L.*	before flow.	115	16	18	158	
" " 1 years' growth,			90		13	150	
" Lactucæ,	Lactuca virosa, *L.*	before flow.	125	20	16	128	
" Nucis vomicæ, with 3000 alcohol by digestion 102 p., decoc., 106, in Mohr's appar., 121 p.							
" Secalis cornuti, " 106					" 183		

Table IV.

The ethereal extracts were made by macerating 1000 parts of the dry powdered substance, at 15° C. employing 3000 parts ether, spec. grav. .730. loss of ether ⅓, and by decoction in Mohr's apparatus, with 6000 parts ether, loss one-quarter.

Extractum Filicis maris,	93 parts	by maceration,		146 parts	by decoction.
" Mezerei,	61	"	"	82	" "

In conclusion, the authors quote the interesting tables from Buchner's Repertorium, 1843, concerning the quantities of extracts yielded by alcoholic tinctures, and also tables of solubility, volatibility, and the influence of heat on the vegetable alkaloids and their sulphates.

CHLORINATED LUNAR CAUSTIC.

By J. Lawrence Smith, M. D.

Prof. Chemistry, Medical Department University of Louisville.

About two years ago my attention was directed to the importance of giving strength to the fused nitrate of silver, without interfering materially with its purity. I then satisfied myself of the value of the introduction of chloride of silver into lunar caustic. No practical developement was given to this fact until lunar caustic became an object of manufacture at the Louisville Chemical works; I then prepared some of it, with a certain proportion of chloride of silver, in the manner to be described, and distributed it among surgeons and physicians. Having heard from many of those who have fairly tried it, I am fully prepared to submit it to the medical profession as an improved form of lunar caustic for many purposes; and I am still more encouraged to do this, from the fact that Dr. Ed. R. Squibb has lately submitted it to the Pharmaceutical Convention as being of sufficient importance to be added to the officinal pharmaceutical preparations of silver.

Those who use lunar caustic, know that it is subject to two objections; first, its great friability (which is also variable, dependent upon the temperature of the mould in which it is cast); and secondly, its too great solubility, so that in touching a moist surface, almost invariably more is applied than is designed or required.

Nitrate of potash and nitrate of soda are often fused with nitrate of silver, but these are objects of adulteration, and the use of them gives scope to an unlimited deterioration of this valuable caustic, and therefore should be discountenanced as much as

possible; and as there is a very simple test by which the purity of lunar caustic may be established, physicians can protect themselves against this adulteration. The test will be found at the end of this note.

To make the chlorinated lunar caustic, I originally added a small quantity of chloride of sodium to the nitrate of silver, so that when the mass was fused, about eight per cent. of chloride of silver resulted from the decomposition. This method was found objectionable, as it introduced a small quantity of nitrate of soda in the mass, so the following is the method proposed for general adoption:

Take Cryst. Nitrate Silver, ...	480 grs.
Dry Chloride Silver, ...	38½ "

Fuse the mixture, and cast in the ordinary moulds.

Dr. Squibb suggests the following method:

Take Nitrate Silver, ...	960 grs.
Muriatic Acid, ...	40 "
Distilled Water, ...	½ fluid oz.

Mix the acid and water in a suitable vessel, add the nitrate of silver, reduce to dryness, fuse, and cast in moulds; this introduces five per cent. of chloride of silver in the lunar caustic.

Either of these methods may be employed, but I prefer, for manufactural purposes, the first formula, as the dry materials are used, and the execution of it is not subject to the delay of getting rid of water by slow and careful evaporation, and moreover, the varying strength of commercial muriatic acid may make a difference in the proportions, if not previously tested.

I have placed this lunar caustic in the hands of a number of surgeons and physicians, all of whom concede to it valuable properties in reference to its solidity and diminished solubility.

It has been in the hands of Drs. Miller, Flint, Yandell, Marshall, and others in this city; Dr. Pope, of St. Louis; and Drs. Gross and Bache, of Philadelphia; and the reports from them all lead me to propose this form of lunar caustic for general adoption. As regards the exact per centage of chloride of silver to be used, this must be left to experiment by the surgeons.

A very large quantity of lunar caustic, contains a greater or less proportion of nitrate of potash or any other cheap salt, and

as this often falls into the hands of physicians when they desire the pure article, it is well to have a ready and simple test that every physician may apply. The following one, proposed by Dr. Ed. R. Squibb, answers the purpose perfectly well:

"A small fragment of nitrate of silver, crushed to powder with a knife-blade upon a piece of paper, the powder spread out over the paper, and the paper and powder then rolled up in a small match-like roll, twisted, set on fire, and burned, *leaves a tasteless residue of pure silver.* But if the nitrate of silver contains even one per cent. of any saline impurity, the residue, instead of being tasteless, will have the sharp alkaline taste of the base of the adulterating salt. With this test, no one need be deceived by No. 2 lunar caustic, nor by the adulteration of the crystallized nitrate with chlorate of potash, &c.; and even the small proportion of sal prunelle that is often added to the so-called pure or "No. 1 caustic" to make it run well, is detected in a minute with equal certainty. This test answers equally well for the purity of the chlorinated lunar caustic."

Instead of crushing the lunar caustic on a piece of paper, wrapping and then burning, I have found it preferable to dissolve it in a little water, moisten a piece of paper with the solution, dry it, roll the paper up and burn. By this modification I have never failed to produce complete decomposition, whereas in manipulating the lunar caustic as prepared by Dr. Squibb, I have failed more than once to produce a complete decomposition, and upon tasting the residue, found undecomposed nitrate of silver.

With these facts before them, physicians need never be deceived with impure lunar caustic.—*Louisville Seminary Monthly Medical News, Feb.* 1, 1859.

ON THE BEHAVIOUR OF BORACIC TO TARTARIC ACID.

By H. Rose.

In the combinations of cream of tartar with boracic acid and borax, the boracic acid is supposed to act the part of a base; several facts, however, are against this view.

The solution of boracic acid in alcohol burns with a green flame, owing to the formation of borate of ethyle; boracic acid, united with a strong base, does not show this green color, which only appears after the addition of a strong acid, particularly sulphuric acid. Several organic acids, principally the tartaric, act like strong bases, by depriving the boracic acid of this property; a considerable quantity of the organic acid however is necessary; a mixture of 10 equiv. tartaric ($C_4 H_2 O_5 + HO$) to 1 eq. boracic acid, dissolved in alcohol, burns without the characteristic green color, which appears instantly on the addition of sulphuric acid. Among the inorganic acids, only the phosphoric has a somewhat similar behaviour, but it requires a larger proportion of it, and sulphuric acid restores the color also in this case. In a like manner the addition of sulphuric acid is required to the different kinds of tartarus boraxatus, to show the green coloration of the flame peculiar to boracic acid burning with alcohol.

All attempts to displace the basic water of tartaric acid by boracic acid proved of no avail, and therefore in order to determine which of the two acids in their combination acts as a base, a solution of 1 eq. of boracic to 10 eq. of tartaric acid was subjected to the action of a Grove's battery, consisting of but 2 elements in order to prevent the decomposition of tartaric acid. The poles were made of strips of platina separated by a clay cylinder. After several hours the liquid on the poles was examined, when that from the positive pole on the addition of strong alcohol burned with a green flame, which was not the case with the liquid from the negative pole, until after the addition of sulphuric acid. After this result it will be incorrect to consider the boracic acid the base when combined with tartaric acid. Uric acid is of precisely the same behaviour.

The reaction of boracic acid with curcuma paper has been

asserted as a reason for its alkaline behaviour. But the reaction of alkalies takes place immediately with a brownish red color, assuming a violet shade on drying, or even disappearing entirely after some time, if the alkaline solution has been very weak (lime water); the brown coloration produced by boracic acid, however, takes place after drying the paper; though characteristic, it is not strong, but may be decidedly deepened by previously mixing the boracic acid with a stronger acid, such as hydrochloric, nitric, tartaric, but especially dilute sulphuric acid, all of which increase the coloration more than acetic and other weaker acids; the paper, after drying, is then of a deep red color.

Curcuma paper is turned brown instantly by a solution of borax, the color fading on drying, usually leaving a reaction of boracic acid. The reaction of borax therefore is similar to that of a weak alkaline solution; but it ought to be much stronger, if the reactions of boracic acid and the alkalies were occasioned by the same cause. The shade of the reaction by boracic acid mixed with another acid is a little different from that by pure boracic acid, but it is often an excellent means to discover the presence of small quantities of borates.

Though somewhat varying in the shade, similar reactions on curcuma paper are obtained by solutions in strong acids of zirconia, and of the acids of the following metals: titanium, tantalum, niobium, tin.—(*Monatsber. d. Acad. d. Wissensch. zu Berlin, Dec.* 1857.)

Note by Prof. A. Buchner.—Several years ago, Prof. A. Vogel, jun., had drawn attention to the difference between the reaction of alkalies and boracic acid upon curcuma paper, (Rep. f. Pharm. 3d ser. iii. 178). He dilutes a tincture of curcuma to a light yellow color and adds a concentrated solution of borax, whereby, owing to the alkaline nature of the salt, a brown coloration is produced, reassuming the original yellow on the addition of sulphuric acid; if more sulphuric acid is added, boracic acid is liberated, reacting with a reddish brown color, which is not changed again to yellow by a larger quantity of sulphuric acid. —(*From Neues Repert. f. Pharm.* 1858. 193—197.)

J. M. M.

INQUIRIES INTO THE FORMATION OF GUM TRAGACANTH.

By Hugo von Mohl.

(Translated from the *Botanische Zeitung*, Jahrg. XIV., p. 33, 1857, by Berthold Seeman, Ph. D., F. L. S., with corrections by the Author.)

Concluded from page 165.)

After this examination of the tragacanth gum, I proceeded to that of the stems, extending it to those of the following species belonging to the section *Tragacanthæ*, viz: *Astragalus angustifolius*, Lam., *A. aristatus*, L'Hérit., *A. Anacantha*, M. B., *A. aureus*, Willd., *A. Barba Jovis*, De Cand., *A. breviflorus*, De Cand., *A. bunophilus*, Boiss., *A. campylanthus*, Boiss. *A. Caucasicus*, M. B., *A. cephalanthus*, De Cand., *A. chromolepis*, Boiss., *A. compactus*, Willd., *A. creticus*, Lam., *A. cyllenius*, Boiss. et Heldr., *A. denudatus*, Stev., *A. echinoides*, L. Hérit., *A. echinus*, De Cand., *A. erianthus*, Willd., *A. gossypinus* Fisch., *A. lagopodiodes*, Vahl., *A. leiocladus*, Boiss., *A. massiliensis*, Linn., *A. microphysa*, Boiss., *A. murinus*, Boiss., *A. persicus*, Fisch. et Meg., *A. plumosus*, Willd., *A. pseudotragacantha*, M. B., *A. ptychophyllus*, Boiss., *A. pycnocephalus*, Fisch., *A. tumidus* Willd. Amongst these there were only four species in the stem of which no tragacanth formation could be discovered, viz., *A. aristatus*, L'Hérit. (from the Pyrenees,) *A. massiliensis*, Linn., *A. angustifolius*, Lam., and *A. echionoides*, L'Hérit. In all the others, the formation of gum tragacanth, in a more or less abundance, was apparent.*

The structure of the stems is in general as follows:—The wood consists of thin annual layers, and is extremely tough, easily tearing lengthways into thin filaments. It incloses a thin column of pith [*ein enges Mark*], is crossed by numerous medullary rays, and does not exhibit anything unusual. The same may be said of the bark which contains perfectly formed liber, and is covered by a strong tough periderm. But the pith and a great part of the medullary rays are very curious; for, instead of presenting a thin-walled parenchymatous texture, they

* The question whether the transformation of the cells into gum tragacanth to be described below, also takes place in species belonging to other sections of the genus I have not specially investigated; but I may remark that I met with the same transformation in two species belonging to the section *Incani*, which I selected at random, viz., *A. brachycarpus*, M. B., and *A. angulosus*, D. C.

appear to the naked eye as a hard, transparent, gum-like mass, which becomes gelatinous in water. There is also often to be found upon the cut surface of the stem a dry projection of gum, which has issued from the interior of the pith.

Aided by the microscope, we perceive at first sight that the gum-like mass which fills the pith cavity [*Markhohle*], and the medullary rays, or which has issued from the pith in the place where it has been cut, does not consist of dried mucilage [*nicht aus einem eingetrockneten Gummischleim*], but actually of the cells of the pith and medullary rays, which have undergone a more or less complete transformation into gum tragacanth.

Generally this transformation has not occurred to all the cells of the pith and medullary rays; but the outer layers of medullary ray, which are nearest to the cells of the wood, consist regularly (and, in like manner the outer part of the pith, situated nearest to the woody fibres, consist, not unfrequently) of the usual, thin-walled, parenchyme-cells, the membrane of which becomes violet on the application of an iodized solution of chloride of zinc:—These unchanged cells, however, form generally only a very thin stratum, consisting of a few cells, whilst all the remaining cells constituting the central mass of the pith and medullary rays are transformed.

That the peculiar condition of these cells is the effect of a transformation of ordinary parenchyme-cells, and not a condition peculiar to the cells of these parts from the first, is proved by the pith and medullary rays of the tops of branches, which present nothing unusual.

The transformed cells differ in respect to their physical condition from common cellular tissue in presenting a substance, which, when dry, is very hard, transparent, and gummy, and which, when wet, is swollen and slippery. Placed under a microscope, these cells (if their transformation has not advanced too far) exhibit the angular form and the close approximation of parenchyme-cells, but their walls are very thick, and evidently composed of numerous very thin strata; their primary membrane may be exactly distinguished from the secondary incrassating strata [*Verdickungsschieten,*] and is not incrassated, as is distinctly seen in a transverse section of the pits in which the primary membrane lies free. The whole form of these cells, the

evident stratification of their membrane, the jelly-like softness of the latter when moistened, render them very similar to the well known cells of the cotyledons of *Schotia*.

In this transition state into gum tragacanth, occur, according to circumstances, partly those cells which border the still unaltered layers, partly also those which form the centre of the pith and the medullary rays, as I observed in the young stems of *Astragalus cyllenius*, Boiss., which plant, according to Orphanides, is one of those from which tragacanth is collected in Greece.

When the transformation has progressed a degree further, the various cells swell in water to a globular form, and become more or less perfectly separated from each other, but still retaining their complete integrity; while, on the application of iodine, no mucilage is observed issuing from them into the water. In the latter respect, I found, however, in some pieces (*Astragalus aureus*, Willd., *A. pseudo-tragacantha*, M. B., *A. compactus*, Willd., *A. pycnocephalus*, Fisch.) a striking exception. There appeared in the water surrounding the cells a mucilaginous substance, which, it would seem, was soluble in water, and on application of iodized solution of chloride of zinc, instantly assumed a beautiful indigo blue color. The amorphous contents of the cells as well as those of the unchanged medullary rays and of a part of the cells of the bark, were colored in like manner. The tint, however, was not lasting, for within a few hours the blue had entirely disappeared, giving place to a yellowish tinge. This phenomenon reminds us again of the cells of the cotyledons of *Schotia*, from which water extracts a mucilage, which is rendered blue by iodine, and is coagulated by alcohol. In other cases, as in *Astragalus cyllenius*, water extracts from the transformed cells a mucilage, which iodine renders yellowish; but this, like the mucilage that is rendered blue by iodine, is an exception.

When the transformation of the cells into gum tragacanth has advanced further, it is impossible to distinguish whether the membranes (which swell up very much in water) are composed of many thin layers or not. This transformation into a mass of homogeneous appearance, proceeds in the cell membranes from without or within; for I observed (in *Astragalus marinus*) cells in which the change had extended only to the outer half of the

walls of the cells, while the inner, by a sharp line separating it from the outer homogeneous mass, still showed fine stratification.

Finally, the last transformation into perfectly formed tragacanth takes place when the cells lose their outer solid definition [*Begrenzung*], and these outer layers become merged into a more or less uniform, mucilaginous mass; in which condition (as is also often the case in exuded gum) the inner layers may still be present in their perfect integrity.

The cells transformed in the manner described, present, at least when moistened, a much greater diameter than the thin-walled cells out of which they were formed; thus, one of the larger, unaltered cells of the medullary rays of *Astragalus denunatus* has a diameter of 0‴.0064, whilst a transformed, yet sharply defined cell of the inner part of the same medullary ray, was 0‴.035, that is about five times the size; in *Astragalus echinus* the size of the transformed medullary cells had increased to 0‴.06, and thus attained about the same size as the cells contained in exuded tragacanth.

The cells are affected by the action of iodine, according to the degree of transformation they have undergone. The unchanged cells of the pith and medullary rays are rendered deep violet in twenty-four hours by the action of an iodized solution of chloride of zinc. The same occurs in the cells which have only been transformed in a slight degree and still possess the form of angular, but thick-walled cells of parenchyme. This coloring is, however, not uniform throughout the whole thickness of the walls and of the cells, but it is principally the outer and inner layer that is vividly colored; several thin layers among the secondary strata exhibit also a violet color. Whether the [apparently] uncolored strata situated between these two colored ones were entirely without color, or were of very pale violet, I could not make out. A similar condition is often observable in other thick walled parenchyme-cells, which soften and swell up in water, as for instance, in those of *Schotia*.

The more the breaking up of the cells, and their transformation into gum tragacanth progresses, the more pale violet does the general body of them become; while uncolored, or faintly colored strata, more and more preponderate over the colored ones, and the colored strata, especially the outer, show a fainter col-

oring, perhaps only in consequence of their larger mechanical extension.

The observations here detailed will leave no doubt that gum tragacanth is neither a secreted sap, dried by exposure to the air, nor an independent cryptogamic organism; but that its formation is owing to a more or less complete transformation of the cells of the medullary rays into a gelatinous mass, which, when brought into contact with water, increases in volume to several hundred times the original size of the cells.

Whether the production and exudation of the gum takes place in one and the same place of the stem only once, or whether it is repeated several years, can of course only be found out in the native country of the tragacanth plant; but perhaps the conjecture, that the appearance of the gum continues through a long time, is not too bold. The transformation of the pith can of course only take place once in any given part of the stem, and this source will become exhausted after the exudation of the gum formed has sooner or later been effected. It may be different, with respect to the medullary rays, as not all medullary rays of a given part of the stem undergo their transformation at the same time. At least in the younger stems examined by me, only a part of the medullary rays had undergone this transformation, while the remainder still exhibited the ordinary structure of thin-walled cells. We may also venture to assume that the great solidity of the periderm covering the stem, is the reason why the forcing of the gum through the bark takes place every year out of a limited portion of the medullary rays, and that consequently, perhaps, many years may elapse before all the medullary rays of a stem have discharged themselves.

Looking around in the vegetable kingdom for analogous transformations of cells into mucilage, we find them to be by no means of rare occurrence. Alexander Braun (*Verjungung der Pflanze*, p. 203) remarks that, in a manner quite analogous, a softening of the membrane of the cells, their swelling up into a gelatinous form and diffluence [*zerfliessen*], are phenomena of common occurrence in the natural order *Palmellaceæ* and *Chroococcaceæ*, and that analogous changes in the membranes of the cells are met with in *Hydrodictyon* and *Botrydium*, and that the jelly-like softening of the membranes of the mother cell of pollen granules

is connected with the decomposition afterwards affected. I have also convinced myself that the formation of the abundant intercellular substance of the albumen of several leguminous plants, as *Gleditschia* and *Sophora*, indicates in a manner perfectly analogous the transformation of outer cellular strata into a homogeneous jelly, in which, often for a long time afterwards, traces of the primary membrane of the cells can be recognized, until even these entirely disappear. Nor do I doubt that the formation of the intercellular substance of *Fucoideæ*, of *Chondrus crispus*, &c., is indicative of an analogous event. We have consequently, in the formation of gum tragacanth, a special instance of a widely diffused process of disorganization of cellulary membrane, proceeding from exterior to interior, at one time affecting the whole wall of the cells [*die ganze Zellwand*]; at another, attacking only the outer layers, and ending with their transformation into a more or less soluble jelly. On the other hand, I consider it less appropriate to range, as Unger does, the formation of gum tragacanth, in the same parallel with the formation of secondary and tertiary gelatinous cell-membrane, such as occur in the *testa* of *Cydonia*, *Linum*, *Collomia*, *Ruellia*, &c.; at least I am not aware that these, before they possess the condition of gelatinous membranes, were previously in the condition of membranes of cellulose.—*London Pharmaceutical Journal, Jan.* 1859.

ON SOLUBLE PYROPHOSPHATE OF IRON.

By M. Robiquet.

To obtain the soluble, or citro-ammoniacal pyrophosphate of iron, M. Robiquet dissolves the pyrophosphate of iron in a gelatinous condition, (as obtained by precipitating the pyrophosphate of soda with persulphate of iron,) in a solution of citrate of ammonia. When the liquor is clarified, it is kept during some minutes at ebullition, filtered and evaporated at a gentle heat to the syrupy consistence, spread on plates with a brush and the desiccation finished in a stove.

The product obtained is presented under the form of light yellowish transparent vitreous scales. If instead of drying it

on plates, the operation is performed in a capsale of the temperature of the water bath, the salt is obtained in beautiful bottle green transparent masses, like soluble cream of tartar.

Thus prepared citro-ammoniacal pyrophosphate of iron is very soluble in water, its solution does not possess the characteristic disagreeable taste of the salts of iron, and the chemical properties of the metal are in part masked, as in the tartrate of iron and potassa and the pyrophosphate of iron and soda. According to M. Robiquet 100 parts of this salt contains of

Pyrophosphate of Iron (anhydrous)	64.736
Citrate of Ammonia	28.967
Water of combination	6.315

Repertoire de Pharmacie.

ANALYSIS OF THE ROOT OF BRYONIA ALBA.

By G. F. Walz.

Ten lbs. of the dry root were exhausted by alcohol of 0·830 sp. gr., the alcohol distilled off in the water bath, and the residue evaporated to dryness. This extract was treated with cold water; the reddish yellow solution had an acrid bitter taste, was rendered turbid by sugar of lead, but precipitated with a yellow color by subacetate of lead. This precipitate after having been thoroughly washed, was decomposed by hydrosulphuric acid; the solution was evaporated to dryness to drive off acetic acid, when the residue weighed about 5 drachms. Absolute ether took up the greater part of it with a reddish brown color, and left after evaporation a crummy mass, which was partly dissolved by absolute alcohol, while the balance was separated in white crystals—*bryonitin*. The residue which had not been dissolved by ether, proved to be *gum*, reddish brown *coloring matter* and *bryonin*; the coloring matter was removed by sugar of lead, the gum by subacetate of lead, and after the removal of the lead, the bryonin was precipitated by tannin, a little adhering bryonitin being dissolved by ether. The sulphuret of lead obtained as above, was exhausted with alcohol, which left a brown, brittle, glossy and bitter residue, insoluble in ether and not precipitable by an alcoholic solution of sugar of lead.

The liquid filtered off from the precipitate by subacetate of lead, was freed of lead by hydrothionic acid; the sulphuret of lead, after having been well washed, was exhausted by alcohol, this evaporated, the residue redissolved in absolute alcohol, which left behind gum, a little coloring matter and traces of bryonitin. From the residue, after the evaporation of the alcohol, ether dissolved a part, which after distilling off the ether, was insoluble in water, but soluble in alcohol with the exception of a little bryonitin. That part insoluble in ether, was partially dissolved by water; alcohol took up the remainder which proved to be the brown glossy body mentioned above. The aqueous solution contained coloring matter, gum, much bryonin with traces of bryonitin.

The solutions of that matter which was soluble in ether, but was freed of bryonitin by absolute alcohol, were mixed and precipitated by acetate of lead in alcohol; the precipitate, after decomposition, furnished a peculiar fatty matter, while the solution left a bitter resinous yellowish red substance.

The obtained bryonitin was dissolved in ether, treated with animal charcoal, the ether distilled off, and the residue dissolved in boiling water, which left behind a brown resin, and furnished by crystallization pure bryonitin.

The watery solution from which the lead had been removed by hydrothionic acid, was of a pale wine yellow color and intensely bitter; its precipitate with tannin, on being heated in the liquid, contracted to a shining resin-like mass; the acid solution, on being neutralized with carbonate of soda, afforded some more precipitate, but retained tannic acid and some bitter principle. After treating successively with subacetate of lead, sulphuric acid and soda, on evaporation an intensely bitter extract was left behind, containing only traces of bryonitin, a little gum, sugar and bryonin.

The tannic precipitate was dissolved in alcohol, digested with lime, and evaporated; ether took up a little of the bitter resin; the residue, after redissolving in water, precipitating by tannin and decomposing by oxide of lead, dissolving again in water and treating with animal charcoal, was pure bryonin.

The resinous residue of the alcoholic extract, washed with water, was treated with absolute alcohol; the insoluble residue

dissolved in ether leaving a tasteless gummy mass behind. The ethereal solution, after evaporation and treating with boiling water, yielded bryonitin. The part insoluble in water, was added to the other ethereal solution. The alcoholic solution, after repeated treatment with ether, acetate of lead, alcohol, &c., yielded more bryonitin and a soft fatty matter of a peculiar smell but devoid of all bitterness.

The results are: the aqueous solution of the alcoholic extract contains much bryonin, little bryonitin, yellow resin soluble in ether, brown fat, coloring matter soluble in water and alcohol; the portion insoluble in water contains little bryonin, more bryonitin, yellow resin soluble in ether, brown fat, coloring matter soluble in alcohol.

Bryonin on being treated with acids splits into sugar and two bodies, of which one is soluble in ether—bryoretin, and one insoluble in that liquid, hydro-bryotin. Of each of these bodies the author has made three elementary analyses, of which the following is an abstract.

Bryonin loses at 100° C 5·65 per cent. water.

		Anal. Med:	Calcul.
	C 96	59·91	60·00
	H 80	8·37	8·33
	O 38	31·72	31·66

		Anal. Med:	Calcul.
Bryoretin:	C 42	63·09	63·13
	H 35	8·78	8·77
	O 14	28·13	28·10

		Anal. Med:	Calcul.
Hydrobryotin	C 42	60·00	60·43
	H 37	9·36	8·87
	O 16	30·64	30·70

Bryoretin	= C 42	H 35	O 14
Hydrobryotin	= C 42	H 37	O 16
Sugar	= C 12	H 12	O 12
Bryonin+4HO	= C 96	H 84	O 42

The sugar was estimated by Fehling's test.

Neues Jahrb. f. Pharm. and Wittstein's Viertelj. 1858. 550–558.

J. M. M.

ON THE VOLATILE OIL OF THE SEED OF CICUTA VIROSA.

By Julius Trapp.

The author obtained from 10 lbs. of the seed collected in autumn and dried, by distillation with water, 2 oz. of a nearly colorless thin volatile oil, lighter than water and of the taste and smell of the oil of cuminum cyminum. In accordance with

Bertagnini's method it was treated with a concentrated solution of bisulphite of soda, when gradually the mixture congealed to a white crystalline mass, in consequence of the combination of soda with the aldehyd of the oil. The crystals were expressed from the excess of the soda solution, washed and repeatedly recrystallized from diluted alcohol, the crystalline scales were of a pearly lustre, efflorescent in the air, little soluble in absolute alcohol and ether, insoluble in cold water, and decomposing with water at a boiling temperature; they contained 8·67 per cent. sodium, and are a combination of cumin-aldehyd with bisulphite of soda; the formula C_{20} H_{16} Na S_2 O_{10} demands 8·52 Na.

The expressed liquid, which was partly absorbed by the bibulous paper, furnished on distillation with water about ½ oz. of a volatile oily carbohydrogen, of the smell of cymen from cumin seed and distilling over at 176° C. (349° F.) On treating this colorless limpid oil with fumigating sulphuric acid, diluting with water, neutralizing with carbonate of lead, filtering and evaporating, scaly crystals were obtained containing the same amount of lead as the sulphocymenate of lead C_{20} H_{13} Pb S_2 O_6. From the mother-liquor the baryta salt was prepared containing the per centage of baryta required by the sulphocymenate of baryta C_{20} H_{13} Ba S_2 O_6.

These experiments lead to the conclusion that the carbohydrogen of the volatile oil of cicuta virosa is indentical with cymen, and the whole volatile oil of the water-hemlock seed identical with oil of cumin seed.—*Bulletin de St. Petersb.* xvi.—*Buchner's N. Repert.* 1858, 471. J. M. M.

COMMERCIAL OTTO OR ATTAR OF ROSES.

At the Pharmaceutical Meeting, Edinburg, Jan. 13th, Mr. Mackay read an interesting communication on the Commercial Otto or Attar of Roses. In the introductory part of the paper he glanced at the various recognized modes of producing this article in the East Indies, China, Persia, Damascus, Asia Minor, and Adrianople. He stated that although the chief supplies both of commercial and virgin otto were sent from Constantinople and Smyrna into England, there was little or none made

in either of these places. The principal place of manufacture he understood to be the neighborhood of Adrianople, where the *genuine* or virgin otto was put into circular drums or vases, and after being stitched up in thick felt jackets were sent to the capital of Turkey, where a system of adulteration took place, by mixing the genuine article with geranium, scentless sandal wood, or some other objectionable oil. After this adulteration, it was filled into Turkish otto bottles, and sent home here as *good* or *bad commercial* otto, according to the amount of adulteration practised. The tins were also sent home intact, and hence the reason why the *best otto* was to be had *not* in original Turkish bottles, but in separate ounces or pounds, under the term *virgin*.

He then referred to the difficulty of detecting the precise quantity of geranium oil added to otto. The test given was to mix the otto with pure concentrated sulphuric acid, but this did not answer the purpose. He submitted several samples of various priced ottos under the influence of sulphuric acid, and it was observed that two of the most costly, one being 26*s*. 6*d*. and the other 28*s*. per ounce in London, were affected in color by the acid. The ordinary commercial otto certainly showed a deeper tinge of color, but what was somewhat remarkable, the oil of geranium itself, some of which he also showed under the influence of the test, was no deeper in color than commercial otto, at present worth from 17*s*. to 20*s*. per ounce. While, however, the acid thus failed in showing either the fact or the quantity of geranium oil as an adulterating medium in the case of commercial otto, there was a decided evidence given of the presence of sandal wood oil by the addition of sulphuric acid, which he proved by submitting a specimen of otto, which contained nearly a half of sandal wood oil, as well as by the action of the acid upon the oil itself. In the former case the color changed rapidly and became very dark, while in the latter the effect was to produce instantly an almost complete dark brown color approaching to black. This, he thought, showed that, along with the peculiar odor emitted, the presence of sandal oil could be easily distinguished.

In referring to the uses to which otto was put, and speaking of the large demand for this article among perfumers, he gave a

very graphic account of a personal visit he had made to the manufactory of Jean Marie Farina, at Cologne, on the Rhine.

He concluded his remarks by stating his conviction that the best and truest test for the quality of this article lay in its peculiar fragrance, and if there be added to this respectability of merchant, congelation, and price, he thought a more genuine article might be got, than testing by the acid process. This opinion he gave, because though the acid test answers a certain purpose, so far as *depth* of color is concerned, it only does so in cases which would be more easily detected by the organ of smell, or, in other words, the distinctive red color will only be given when the adulterating oil is in such quantities as to be easily distinguishable, and thus to rank it under the name of *Commercial Otto*, but certainly not having any pretension to be recognized as *Pure Virgin Otto.—Pharmaceutical Journal and Transactions, Feb.*, 1859.

ON THE CONTAMINATION OF DISTILLED WATERS WITH TIN.

By Flach, Apothecary of Kevelaer.

Liquids distilled from a metal still have a peculiar smell, which is not observed on distilling the liquids in a glass apparatus. It is apparent that this so-called still odor (Blasengeruch,) has its origin in the employment of metal, and must be similar to the smelling of metals. To find out the nature of the compound imparting the smell, the author has made a series of experiments and demonstrated the presence of tin in all waters distilled and condensed in a tin worm.

From a copper still with head and worm made of pure tin, eight gallons of water were distilled, the first 3½ gallons rejected, the next gallon with the addition of 60 drops pure nitric acid set aside. After four months, on examination, a number of small white floccules like slime had been separated, which for the greater part would pass through the filter, but could be taken out with a glass tube. Under the microscope the floccules appeared to consist of blue and a few yellowish globules, interwoven like the cells of mould. When heated they run together, and were darkened by sulphuretted hydrogen, the blue

globules were soluble in hydrochloric acid, the yellow insoluble; the solution on evaporation yielded feathery needles and rhombic prisms, re-action of sub-oxide and oxide of tin. The presence of tin was likewise proven before the blowpipe upon charcoal, and with phosphate of soda and ammonia, the above distilled water after evaporation gave the re-action of tin, with ammonia, ferrocyanuret of potassium, and hydrosulphuric acid, caustic potassa evolved ammonia, but not a trace of copper could be detected.

All his other experiments proved the presence of tin in distilled waters from the tin worm, whether this was new or had been used for a considerable time. The author likewise thinks, the quantity of ammonia in distilled water larger than in pump water, which he analyzed, and which contained only traces of it. He supposes some water might be decomposed by the tin, this metal uniting with the oxygen, while the hydrogen in the nascent state with the nitrogen of atmospheric air, forms ammonia.(?) The slimy precipitate in distilled medicinal waters contains nearly all the tin, and the slime which is often observed on the inside of a tin head or worm, and which has a greasy touch, is tin. In conclusion, the author draws attention to the traces of tin sometimes found in mineral waters, and suggests they might be owing to the tin of the distilled water employed.—*Archiv d. Pharmacie*, 1858, *Aug.* 156–163. J. M. M.

COMBUSTIBILITY OF POWDERED IRON.

Professor Magnus of Berlin, at the last Medical and Philosophical Convention, at Karlsruhe, has drawn attention to a curious behaviour of powdered iron. It is well known, that iron reduced by hydrogen is very combustible, and may be ignited by contact with a flame, when it rapidly burns to peroxide. Powdered iron obtained from filings or in any other similar way, is under ordinary circumstances not inflammable; such iron made by a mechanical process on a large scale in Tyrol, for medical and pharmaceutical purposes, has repeatedly been sold for iron reduced by hydrogen; as it is very subtile, the fraud can only be detected by its not taking fire on being approached with

a flame. But as Magnus has shown by a very simple, but interesting experiment, it may be made combustible in a high degree if it is magnetized. If a magnet approaches that delicate powder, this is attracted and held up by the magnetic poles, and if now a burning splint is neared, the iron powder takes fire which rapidly spreads, and if the magnet is shaken, many sparks are falling down, being the burning particles of iron.—*Buchner's Neues Repertorium*, 1858, 472. J. M. M.

ON THE PREPARATION OF ROCHELLE SALT.

By Rebling.

The author, after noticing the difficulties and the loss sustained in the attempt of freeing this salt of tartrate of lime, states that he has succeeded in preparing it from the crude and the depurated commercial cream of tartar, and also from tartrate of lime. The following embraces his directions:—

From tartrate of lime.—Take of tartrate of lime 10 parts, purified soda 6 parts, purified potash $2\frac{3}{4}$ parts; boil with twenty to twenty-four parts of water for half an hour, stirring occasionally until a filtered sample is not rendered turbid by carbonate of soda when heated to boiling; after setting aside for a quarter of an hour to allow the carbonate of lime to settle, the liquid is poured through a porous paper filter, the residual lime is twice washed with water, and is afterwards thrown on the filter for the tartrate to be entirely washed out. Tartrate of lime yields a little above its own weight of Rochelle salt.

From commercial cream of tartar.—Cream of tartar generally contains 8—at most 10 per ct. of tartrate of lime, which must be decomposed into bitartrate of potassa, in order to obtain all tartaric acid as Rochelle salt. Take of finely powdered cream of tartar 16 oz., crystallized soda 14 oz., purified potash $\frac{1}{2}$ oz., water 44 oz.; boil for half an hour, until a filtered portion is not precipitated by soda; then filter and crystallize. Almost the whole of the mother liquor will furnish clear crystals; when they cease to form, the liquor may be precipitated by muriatic acid to obtain cream of tartar, or it may be neutralized with pure bitartrate of potassa, when even the soda, which had been

added in excess, will be regained. The alterations in this process are the addition of potash, the employment of soda in slight excess, the boiling of not longer than half an hour, and the use of much less water.

From crude tartar.—The hard crusts of crude tartar contain more tartaric acid than the powder, which is mixed with some earthy matter. The crusts contain about eleven or twelve per cent. tartrate of lime, but their value as compared with cream of tartar is 100:80; from this it follows that the same quantity of potash, but less soda is to be taken. The tartar must be very finely powdered; the deeply colored liquid cannot well be filtered; it is to be cooled down to between 25 and 35° C., (75 to 95° F.) when the white of an egg, previously well-beaten, is mixed with it, and the liquor heated again to the boiling point. The crystals require a recrystallization, the last portions several times; the remaining mother liquor is best precipitated by muriatic acid, but the precipitate is colored, and the color enters into the Rochelle salts prepared from it. The author could not remove the coloring matter either by chlorine or by alum; after boiling with animal charcoal the liquid filters well, but is not much decolorized. The last portions of all the above mother liquors may be rendered turbid from traces of lime; they then require to be boiled over and filtered. 10 parts of Rochelle salts were obtained from 7 parts of commercial cream of tartar, and from 8·8 parts of crude tartar.

The author found that 100 grs. Rochelle salt, perfectly neutral, when dissolved in 150 grs. of water took up 2·5 grs. of tartrate of lime, part of which separated on cooling, but after twelve hours the liquor still contained ½ gr. of the lime-salt in solution; the same quantity of distilled water did not dissolve any appreciable quantity of tartrate of lime.—*Archiv der Pharmacie*, 1858, *Aug.*, 149–156. J. M. M.

ON THE PREPARATION OF LIQUID TARTRATE OF POTASH, AMMONIA, AND PEROXIDE OF IRON.

By M. Carrie.

The potassio-tartrate of iron being incapable of preservation in aqueous solution, on account of its tendency to rapid decom-

position, M. Carrié, a pharmacien in Paris, has conceived the idea of insuring its solubility, and particularly of preserving it, by the addition of ammonia. The following is the mode of preparation recommended by the author:—

Take sixteen ounces of bitartrate of potash; dissolve one-half in three quarts of warm distilled water; saturate this solution with pure sesquicarbonate of ammonia; add the remainder of the bitartrate; raise to a moderate heat, adding by degrees, and to excess, recently precipitated and still moist peroxide of iron; afterwards filter, to separate the uncombined oxide; evaporate at the heat of a water-bath, until the cold liquor marks seven degrees on the saccharometer; add a few drops of liquid ammonia; shake; allow it to deposit during twenty-four hours; filter again, and preserve for use.

The preparation of tartrate of potash, ammonia, and peroxide of iron thus obtained, is, according to M. Carrié, a liquid of an agreeable taste, possessing a reddish-brown color, keeping for an indefinite period, and containing one part of iron in nine of water.—*Bulletin Général de Thérapeutique*, 15th July, 1858, p. 13, *Dublin Hospital Gazette* and *Pharm. Journ.*

PRACTICAL OBSERVATIONS ON THE PRESERVATION AND DISTILLATION OF ROSES AND ORANGE-FLOWERS.

By M. Stanislaus Martin.

The ancient Greeks and Romans, surfeited with the excesses of the table, had recourse to perfumes to stimulate their blunted senses. At Rome, the odor of the rose was in such request, that Lucullus expended fabulous sums, in order to be able to have it at all seasons. During the past century, the odor of orange-flowers was so much in vogue, that the cultivation of Louis the Fourteenth's orange-trees was a source of considerable expense, for the great king would have one of these favorite shrubs in each of his apartments. In our days too, Fashion, that despotic and capricious queen, who, as Montaigne says, twists and turns the understanding of the French, also demands perfumes. The poor will have them, as well as the rich; and their consumption is such, that the perfumers of large cities, particularly those of

Paris, monopolize all the sweet flowers which are brought to market, and leave none to supply the wants of Pharmacy; the consequence is, that the commercial value of such flowers almost always attains to a very high price. Roses are sold for from fifty to sixty francs the hundred-weight; the same quantity of orange-flowers brings from 250 to 300 francs; so that the Pharmaciens are obliged to purchase in the south of France distilled waters, which never possess the sweetness of perfume presented by those manufactured in Paris.

I am certain that this inconvenience may be obviated. Five years of trial and experiment have proved to me that provincial Pharmaciens may preserve odoriferous flowers for several years, or send them from one part of France to another, without their losing their perfume. The preservative agent is sea-salt, that *corpus divinum* of Homer and Plato.

The Hebrews were acquainted with the antiseptic properties of common salt; they employed it in the preservation of their meats. This substance likewise played an important part in the sacrifices of paganism; it was thrown on the flesh of the victims, to retard their putrefaction.

In the middle ages, the alchemists said, *cum sole et sale omnia fiunt.* It was surely this thought that suggested to Wilhelm-bulkels the idea of making use of chloride of sodium in the curing of fish. The plan succeeded so well with him, that Charles the Fifth, being in the Low Countries, went to Bier-Vliet to see the tomb of the humble fisherman, wishing thereby to honor the memory of one who had rendered so great a service to his country.

The use of kitchen salt has already been applied to the preservation of medicinal plants. Trouvain, in his *Apothecaire Charitable*, Baume, Morlot, Lemery, Guibourt, and several other Pharmacologists, speak of it—only the directions have been forgotten. However, it would be rendering an immense benefit to revive the plan, particularly as the mode of operating is very simple. It is sufficient to arrange the rose-leaves or orange-flowers in vessels of stone-ware or glass, interposing a stratum of salt between each layer of flowers, until the vessel is quite full. Care must be taken to choose the driest flowers, and to avoid bruising them; otherwise they would ferment, and the

water obtained from them would acidify, and would in time acquire a smell of valerianic acid, as M. Omar Dabat has observed.

Waters obtained from salted vegetable matters have an aroma as strong and as sweet as those distilled from plants gathered only a few hours previously; that from the rose appears to acquire even greater strength. I have kept petals of the rose for two years; the distilled water yielded by them resembled the Indian attar, or the Athenian essence of roses spoken of by the Jesuit Rapin.

Salt, which has served for the preservation of undried plants, may be used for fresh distillations; it is sufficient to subject the decoction to strong expression, to evaporate the fluid to a suitable consistence, and to allow it to crystallize by rest.—*Bulletin Général de Thérapeut.*, *Dublin Hosp. Gaz.* and *Pharm. Journ.*

MERCURY—ITS OXIDES AND ACETATES IN REFERENCE TO THE EXAMINATION OF BLUE MASS, AND REMARKS ON BLUE MASS.

By Charles Bullock, of Philadelphia.

Much of the powdered blue mass of the shops is prepared by the simple process of drying and powdering. An examination of the character of the mass from which samples of the powder were obtained was, therefore, desirable, to judge properly of the changes it had undergone after pulverization.

For this purpose, a sample of the mass prepared 18 months was examined for oxides of mercury. The process adopted was that of former examiners. The mass, after treatment with successive portions of hot distilled water to remove the soluble matter, was boiled with dilute acetic acid. The filtered liquid evaporated to a small bulk, gave no indication of mercury when treated with sulphide of ammonium.

To one hundred grains of blue mass, one grain of black oxide of mercury was added, and the experiment repeated; not a trace of oxide of mercury could be detected by the process.

From results so unsatisfactory, I was induced to make some examination to determine the cause of error, and to arrive at a reliable method of detecting small amounts of oxides of mercury, when mixed with a large bulk of organic matter.

To show more fully the character of mercury and some of its salts,—claiming attention in connection with blue mass,—I give, in addition to my experiments, the observations of some others.

1st. *Metallic Mercury* "remains unaltered, when agitated for any length of time with oxygen, common air, nitrous oxide, nitric oxide, carbonic acid gas, or alcohol."—*Proust & Vogel.*

2d. *Mercury in a state of minute division*,—as precipitated from its solutions by protochloride of tin,—was not affected by glacial acetic acid when heated over it, and yielded nothing to hydrochloric acid, sp. gr. 1.12, diluted with seven volumes of water.

3d. *Black Oxide of Mercury*, of the U. S. Pharmacopœia, (mercurous oxide), was prepared by acting on hydro-sublimed calomel by caustic potash in excess, washing the oxide till the washings were no longer disturbed by nitrate of silver, and drying in the dark. While washing the calomel previous to acting on it by potash, it was observed that the washings were affected by both nitrate of silver and sulphide of ammonium, a fact which was subsequently found to be stated by Mialhé, who gives the solubility of calomel in various solutions of the alkaline chlorides. It is also stated by Simon, that calomel is taken up by boiling water.

Black oxide of mercury was found to be soluble to an appreciable extent in distilled water at 60° F., giving an evident reaction with sulphide of ammonium. At 212° F., distilled water takes up a much larger quantity, affording a deep brown color with sulphide of ammonium, and a white turbidity, with solutions containing half grain to the ounce of chloride of sodium, or chloride of ammonium, but is not disturbed by hydrochloric acid.

The precipitates afforded by the chlorides were insoluble in the cold in an excess of the precipitants, but were completely re-dissolved by dilute hydrochloric acid. [Hydrochloric acid, when diluted so as to merely redden litmus, did not disturb the solution of the oxide.]

Water boiled over the oxide, and allowed to stand several days, contained more of the oxide in solution than was taken up at 60° F.

Black oxide of mercury is insoluble in cold alcohol of 95 per cent., also in concentrated sulphuric ether, (when free from acidity.) Ether saturated with water does not dissolve a trace; cold water saturated with ether dissolves an amount which may be readily detected.

4th. To distilled water, which had been boiled over the oxide, and filtered while warm, five grains of conf. of rose were added and boiled; after close filtration, the liquid ceased to be disturbed by sulphide of ammonium.

The precipitated matter, when warmed with dilute nitric acid, gave a brown color, with sulphide of ammonium.

5th. Hot distilled water holding the oxide in solution, was not deprived of it by boiling with cane or grape sugar.

6th. To a warm solution of the oxide in distilled water, tannic acid was added, and the solution immediately assumed a red color, changing to pale yellow when boiled. After standing some hours, a slight deposit took place; examined under a glass of considerable power, it had the appearance of a minutely divided powder of a grey color, without lustre. The precipitate was collected on a small watch-glass, washed with alcohol to remove any organic matter, and dried; when rubbed with the point of a knife, metallic globules, visible to the unassisted eye, were collected. The liquid, from which the deposit was obtained, ceased to be disturbed by sulphide of ammonium.

7th. One part of the oxide was added to three thousand parts of distilled water, and boiled in a flask; when nearly cool, half of one part of tannic acid was added; a glass tube was tightly adapted to the mouth of the flask, with the remote end dipping to near the bottom of a test tube, containing a clear solution of caustic baryta. The mouth of the test tube was closed by a stopper of cotton, to prevent free access of air; when the contents of the flask where heated, the color passed from red to pale yellow; the bubbles passing through the baryta solution caused it to become turbid; addition of nitric acid caused effervescence, and the solution became clear.

To prove this experiment, it was repeated, omitting the tannic acid; the baryta water did not show any indications of carbonic acid, from the contents of the flask.

The solution containing the oxide after treatment with tannin,

did not coagulate gelatin; a solution of tannin of the same strength, (half grain in three thousand grains of water,) manifested decided results with gelatin.

When tannic acid is added to water, which has stood twenty-four hours after boiling over the oxide, an immediate red color is produced, changing to yellow more slowly than when heated; after standing twelve hours, mercury in a metallic state is deposited, and the solution is no longer affected by sulphide of ammonium.

Black Oxide of Mercury, prepared from calomel by the process of the U. S. P., examined under a microscope by transmitted light under a power of near three hundred diameters, appeared as an amorphous powder. When placed on an opaque object, and examined by reflected light under a lower power, numerous globules of metallic mercury are seen, the globules varying from the 1-400th of a millimeter in diameter, down. The mercury is visible in a strong light under a good pocket lens, magnifying two diameters.

According to Donovan, "if too little caustic potash be added in the first instance to calomel, there is formed a basic hydrochlorate of mercurous oxide, which abstracts oxygen from the separated oxide, and is itself converted into basic hydrochlorate of mercuric oxide, so that a farther addition of caustic potash produces a mixture of deutoxide, protoxide, and metallic mercury."

Duflos prepares black oxide of mercury "by adding one part of caustic potash lye to twelve parts of absolute alcohol, and decanting the liquid from the resulting precipitate. 11-12ths is mixed with a solution of mercurous nitrate, constantly stirring till the liquid slightly reddens litmus paper, the remaining 1-12th is then added, and the precipitate left to subside, it is then decanted, washed with water, and dried at a moderate heat in the dark. The mercurous oxide thus obtained is black, with a tinge of yellowish brown, giving up nothing to dilute hydrochloric acid, but dissolves completely in strong acetic acid."

Mercurous oxide was prepared according to Duflos' method, care being taken to have the nitrate of mercurous oxide free from mercuric nitrate; when digested at 80° F. with pure hydrochloric acid, sp. gr. 1.12, diluted with an equal bulk of water, it was

almost completely converted into calomel. The acid solution was filtered and evaporated to dryness on a watch-glass, a few drops of water added, and a drop of dilute sulphide of ammonium. A *black* precipitate was immediately produced.

Duflos' black oxide of mercury was treated with dilute hydrochloric acid, (one part of acid, sp. gr. 1.12, and seven parts of water,) the filtered solution evaporated to dryness, and re-dissolved in warm water, afforded a yellow precipitate with caustic potash. When treated with dilute acetic acid and the mercurial salt precipitated by chloride of sodium, the filtrate evaporated to a small bulk also gave a yellow precipitate with caustic potash.

Whether chlorhydric acid takes up anything from black oxide of mercury, when pure, could not with certainty be determined, owing to the difficulty of obtaining a pure black oxide. The partial solubility of calomel in dilute HCl, prevents the application of delicate reagents.

According to Guibourt, "it is impossible to procure this oxide pure, because, during washing, even in the dark, it is resolved into a mixture of protoxide and metallic mercury. Light, even diffused daylight, or a gentle heat, resolves the dioxide into metallic mercury and the protoxide."

Black oxide of mercury prepared by Duflos' method, examined under the microscope by reflected light, shows metallic globules varying from the 1-800th of a millimeter, down to the smallest points visible under a power of 163 diameters. The globules are smaller, and more numerous than in the oxide prepared from calomel.

"Hydrocyanic acid added to mercurous salts throws down half of the mercury, and forms cyanide of mercury."—*Rose.*

Red Oxide of Mercury.—The commercial red oxide, which was preserved in the dark, was employed in the following experiments:

"Aqueous mercuric oxide is slightly soluble in water."—*Thompson, Guibourt, and Donovan.*

"The oxide obtained by use of nitric acid, and the precipiated oxide, dissolves sparingly in cold, somewhat more abundantly in hot water."—*Anthon.*

Water digested at 60° F. on red oxide of mercury, gives an

evident reaction with sulphide of ammonium; at 215° F. a much larger portion of the oxide is taken up, giving a deep brown color on addition of sulphide of ammonium.

Water, which had been heated over the red oxide, and after decanting allowed to stand twenty-four hours, gave a much stronger reaction with alkaline sulphides, than was obtained from the cold solution. But the reaction is more feeble than with the black oxide.

Tannic acid precipitates the mercury from the aqueous solution of the red oxide as metallic mercury. This reaction takes place in the cold, but more quickly when heated.

Red oxide of mercury is completely insoluble in cold alcohol of 95 per cent., also insoluble in concentrated sulphuric ether (free from acid) when saturated with water.

Mercuric oxide gradually blackens when exposed to sunshine, "being resolved (according to Guibourt,) into oxygen and metallic mercury," or according to Donovan, "into oxygen and mercurous oxide."

"Heated solutions of sugar reduce it (according to Vogel) to mercurous oxide."

Under a microscope, mercuric oxide shows translucent orange-colored crystals.

Acetate of Mercurous Oxide "is soluble in one hundred and thirty-three parts of water, at 53 or 59° F., but is not soluble in cold alcohol. When boiled with water, it is resolved into 11 per cent. of mercury, and a solution of mercuric and mercurous acetate containing excess of acid."—*Garot.*

"Sugar converts it into mercury and black oxide."—*Vogel.*

Both acid and neutral solutions of mercurous acetate are decomposed by ammonia, hydrochloric acid, and the soluble metallic chlorides "visible even to the 80,000ths degree of dilution." (*Pfaff.*) The precipitates by hydrochloric acid, and the chlorides in highly dilute solutions, are completely soluble in excess of the precipitants when heated, the solutions remaining nearly clear when cold. The solubility of the precipitates is more apparent from the acid than from the neutral solution.

The chlorides do not precipitate an acid or neutral solution, so that the filtrate is not affected by sulphide of ammonium; it is not, however, affected by potash.

Acetate of Mercuric Oxide "is soluble in four parts of water at 50° F., and in 2.75 parts at 65° F."—*Garot.*

"Boiled with sugar it is converted into mercurous acetate."—*Vogel.*

An acid solution of mercuric acetate is not affected by caustic ammonia.

"Not in any case is it affected by ammonia, when the acid is in excess."—*Garot.*

Ammonia added carefully till slightly in excess, produces no disturbance of the solution.

Caustic potash precipitates the red oxide from the acid solution, but not so completely that sulphide of ammonium does not affect the filtrate. "If the solution is very acid, no precipitate is produced, or a very slight one."—*Gmelin.*

Acetic acid containing a small amount of alcohol, when heated over red oxide of mercury, forms mercurous acetate with the production of acetic ether.

A solution of mercuric acetate, which had stood for several days, was found to afford precipitates with soluble chlorides, though it was not when prepared so affected; an examination into the cause, showed the acetic acid to contain alcohol. Alcohol was then added to a solution of mercuric acetate, and distilled. Acetic ether was obtained.

"With a neutral solution, ammonia gives a turbidity with one part of the salt in 20,000 parts of water."

Hyposulphite of soda gives with acid, as well as with neutral solutions, a lemon yellow color, changing gradually to brown. This reaction is very characteristic of the salt of the red oxide, and is quite marked in a solution containing 1 part of the salt in 6,000 parts of water. The presence of chloride of sodium, or chloride of ammonium, when the solution is very dilute, entirely prevents the reaction.

As a Summary of the Investigation, we have the following:—

1st. Mercury, when pure, is not affected by any exposure to which it is liable. In a state of minute division it is not acted on by boiling glacial acetic acid, and yields nothing to cold muriatic acid, when highly diluted.

2d. Black oxide of mercury is soluble to a very appreciable extent in hot water, the solution, when cold, still retaining a

portion of the oxide. The oxide as prepared both by the U. S. Pharmacopœia and the process of Duflos, contains metallic mercury and red oxide of mercury.

3d. The oxides of mercury in solution in water are completely precipitated in a metallic state by tannic acid—the reaction occurring in the cold as well as by application of heat. The oxides are insoluble in pure washed ether, and in strong alcohol. Heated solutions of cane or grape sugar do not precipitate them from aqueous solutions. Hydrocyanic acid with black oxide of mercury throws down half the mercury and forms cynanide of mercury.

4th. Acetate of mercurous oxide is resolved by boiling water into mercury, and acid solutions of mercuric and mercurous acetate.

5th. Acid solutions of mercuric acetate are under no circumstances affected by ammonia.

6th. If the acetic acid contains alcohol, heat converts a portion of the mercuric acetate into mercurous acetate, with production of acetic ether.

7th. Chlorides do not precipitate solutions of mercurous acetate so completely that sulphide of ammonium does not affect the filtrate. Caustic potash, however, does not affect the solution after close filtration.

We have then as causes from which errors may arise in examining for oxide of mercury in blue mass,

1st. The solubility of both oxides in hot water to a notable extent, and the conversion of the oxide into metallic mercury by the tannic acid contained in the rose leaves.

2d. The solubility of calomel in highly dilute solutions, in dilute hydrochloric acid, as also in large excess of the solutions of the chlorides, thus affording no results with these reagents.

3d. The partial conversion of mercuric into mercurous acetate when heated with excess of acetic acid, which contains alcohol as an impurity.

4th. The conversion by boiling of acetate of mercurous oxide into mercury, and the salts of both oxides.

5th. Ammonia affording no reaction with the acetate of mercuric oxide when the solution is acid.

6th. The difficulty of precipitating salts of the black oxide by

chlorides so completely, that the solution is not afterwards affected by alkaline sulphides.

Separation of the Oxides in acetic solution.—The oxides are readily recognized by appropriate regeants *when in separate solution*, but when the two are mixed, and the solution dilute, the separation and recognition of the acetate of the *red oxide* is not so readily effected.

The *acid* solution is the only reliable one which offers; for the mercurous salt if evaporated to obtain a solution free from excess of acid, is liable to conversion into the mercuric salt.

The mother water from which crystals of the neutral acetate of mercurous oxide were obtained, was found to contain acetate of mercuric oxide.

Caustic potash affords a yellow precipitate, with slightly acid solution of mercuric oxide, containing 1 part in 900 of water. The presence of a small amount of chloride of sodium or ammonium does not prevent the reaction, while the mercurous salt is precipitated by the chlorides, so that potash does not disturb the filtered solution.

When acid solutions made in the cold, of the acetates, containing a grain each to the ounce, are mixed, and a quarter of an ounce of the mixed solutions, equal to a quarter of a grain of each oxide, precipitated by chloride of sodium, the liquid closely filtered and evaporated to near dryness, at a temperature not exceeding 200°F., re-dissolved in a small portion of water divided into two portions and treated, one with caustic potash, and the other with caustic ammonia, satisfactory evidence of the presence of red oxide is adduced; without the evaporation following the precipitation of the numerous salts, the result is very unsatisfactory.

The process which answered best to detect the Oxides of Mercury in Blue Mass, was to wash the mass in the dark, with small portions of cold distilled water, in a small flask, by agitation and decantation, till all coloring matter and sugar was removed; then digest cold, with one part glacial acetic acid, and four parts of water; filter, and if any mercury is present, as will be shown by trying a small portion of the filtrate with sulphide of ammonium, evaporate the acetic solution at a low heat, nearly to dryness; re-dissolve in a small portion of water; precipitate the

mercurous salt by a dilute solution of chloride of sodium, filter closely; render the filtrate alkaline, by careful addition of caustic potash; if any precipitate occurs, wash it by decantation in a test-tube; treat it with dilute hydrochloric acid; evaporate the clear solution to a few drops, and add caustic potash, which will produce a yellow precipitate if any mercuric oxide is present. In this way I was enabled to detect with certainty one half of one per cent. of the two oxides, when mixed with the mass. Instead of washing the mass with water, pure ether mixed with alcohol, can be employed. Cold water, is, however, sufficiently accurate, and allows the coloring matter to be removed more quickly. Dilute chlorohydric acid can also be used, if the red oxide alone is sought for, although a small portion of calomel is formed from the black oxide; if it is present, and dissolved, there is no conversion of any part of it into red oxide. The objection to its use is, that it takes up a much larger portion of coloring matter than acetic acid, thus diguising the effects of delicate reagents.

Blue Mass examined under a microscope shows globules of mercury, the largest of which measures about the $\frac{1}{800}$ of a millemetre in diameter ($=\frac{1}{320}$ of a line.) A specimen made ten months which had been kept from the light, but with access of air, yielded nothing to dilute acetic acid.

Examination of Powdered Blue Mass.

1st. A specimen made two months yielded nothing to dilute acetic acid.

2d. Specimen made eight months yielded nothing to acetic acid.

3d. Specimen made two years, and which had been preserved in a box, thus excluding light, but admitting air, was found to contain mercurous oxide; by a comparative estimate with solutions of known strength, the amount of oxide present appeared to be from half to one per cent. Repeated trials were made for the presence of red oxide of mercury, but none could be detected.

4th. Specimen, a portion of the preceding, which has been kept in a close show bottle in a window exposed to light for twelve months, and during the winter, to direct sunshine during part of the day.

The examination of this specimen detected no red oxide of mercury, but the black oxide in about the same proportions as in the 3d.

From the characters of the oxides of mercury, it would appear that mercuric oxide is not formed from the direct action of the air on mercury or mercurous oxide, but results from the decomposition of the mercurous oxide by the action of moisture and light, by which the mercurous oxide is reduced in part to a metallic condition, the other part passing into mercuric oxide.

The general freedom of the blue mass from black oxide of mercury, and the dry condition of the powdered mass, would seem to be unfavorable for the production of red oxide of mercury in powdered blue mass.

METHOD OF PREPARATION.

Powdered Blue Mass.—Nearly all of the powdered blue mass met with in the market is made by drying the mass, powdering, and then making up the deficiency in weight by adding some inert powder—generally liquorice root. As thus met with, its color varies according to the degree of fineness of the powder; some of the samples we examined were of a dark slate color, while others resemble in color the mercury with chalk.

Two samples obtained from good manufacturers showed under the microscope globules of mercury somewhat larger than in the mass; the globules were less evenly distributed than in the mass.

Mercury is readily extinguished by trituration with powdered liquorice root, adding from time to time sufficient water to keep it in the consistence of a paste.

The globules are not visible under a lens of two or three diameters, but if the pasty mass be rubbed between the thumb and finger till dry, the liquorice powder is rubbed out, leaving globules of mercury adhering to the fingers; when dry, the powder is in a rough coarse state; an attempt to pulverise it revives the mercury. If, instead of water, alcohol is used, the powder does not dry so hard; but, if rubbed under the pestle, globules of some size soon appear. Addition of honey to the alcohol in

the proportion of one-eighth of the mercury used, is of great advantage, both in extinguishing the mercury and preventing the revival of it by rubbing between the fingers. The powder, however, dries hard, and subsequent pulverization makes the mercury visible.

When prepared by washing out the soluble matter with warm water, the pasty mass spread out thinly on plates of glass to dry becomes very hard; an attempt to powder it increases the size of the globules, sometimes aggregating them so much as to be visible to the naked eye.

The difficulty of reducing blue mass to a fine powder without aggregating the globules of mercury and the hygrometic condition of the powder, due chiefly to the honey it contains, renders both the process and the product ineligible.

The following process gave the best results after a number of varied experiments:

R.—Finely dusted Elm bark .	1 part.
" " Sugar . .	1 "
Mercury	1 "
Alcohol	q. s.

Rub the mercury with the powdered elm bark, adding sufficient alcohol, from time to time, to maintain a pasty consistence, till the mercury is completely extinguished; then spread the ingredients on paper to dry. The mass when dry does not adhere, and is readily reduced to a fine powder; then mix in the sugar, rub till thoroughly mixed and pass through a sieve of fine bolting cloth.

As thus prepared the powder is of a light slate color—about the color of mercury with chalk; under the microscope it showed globules of mercury very evenly divided, not larger than those in the best prepared mass.

If desired, a portion of the sugar can be omitted, and replaced by finely powdered rose leaves.

As thus prepared, it is scarcely entitled to the name of powdered blue mass, but fulfils all its chemical conditions.

In rubbing mercury with powdered elm bark, wet with alcohol, the mercury is rapidly extinguished. If the trituration is continued after the powder becomes dry or nearly dry, the mer-

cury is revived, and globules of considerable size collect at the bottom of the mortar.

NOTE.—In making the microscopic observations, the reflected light which alone could be used was not strong enough to allow the markings on the micrometer to be read. The determinations were made comparatively with objects of known dimensions.

Proceedings of Amer. Pharm. Assoc. 1858.

OILED PAPER AS A SUBSTITUTE FOR OILED SILK AND GUTTA-PERCHA IN SURGICAL DRESSINGS.

This material was introduced by Dr. James McGhie, of the Glasgow Royal Infirmary, and has been used with success in hospital practice.

The following is the mode of preparing it:—

Having secured a paper of good texture, the next desideratum is the fluid or varnish by which it is to be coated and waterproofed. This is made by re-boiling boiled linseed oil with litharge, acetate of lead, sulphate of zinc, and burnt umber, an ounce or two of each to the gallon of oil. No artificial heat is employed in drying. A square board is now procured, several inches broader than the size of the sheet to be prepared. Upon this the sheet is spread, and well covered, by means of a broad brush, with the mixture. The first sheet should be brushed on both sides. On this a second sheet is placed, slightly projecting over the first, at one end, in order to facilitate the lifting of the sheets when they are to be hung up to dry. This is also to be coated with the mixture. This process is to be repeated till a mass of sheets, from twenty to fifty in number, is prepared. The board is then to be carried to some unoccupied apartment, across which cords have been stretched, and the sheets are to be lifted *seriatim*, and attached by one end to the cords by means of bent slips of zinc or tinned iron. A very small space is sufficient to hold a hundred sheets or more. After twenty-four hours or more, it is ready to be taken down. As the sheets are found to be liable to stick to one another, they may be dusted with French chalk, which prevents adhesion. The addition of a little wax and turpentine renders the dusting or any other measure unnecessary. There is only one part in the above process where any manipulatory difficulty may at first be encoun-

tered, and that is in spreading, evenly and expeditiously, the dry sheet on the oiled one. This is easily overcome by working the brush freely from the centre to the circumference of the sheet.

The following are its more obvious advantages:—

1. Its extreme cheapness does away with any inducement which might otherwise exist to employ the same piece more than once. A ream, or 480 sheets of paper, costs from 7*s.* 6*d.* to 10*s.*, and a gallon of the prepared oil about 8*s.*; so that each sheet costs a fraction of a halfpenny. This does not include the cost of manufacture, which would slightly increase the expense.

2. Its transparency.—When applied over the dressings of a stump, or any cut surface, when hemorrhage may be feared, the danger can be seen at once, and obviated.

3. Its lightness.—It adds little to the weight of dressings, and it can cause little or no pressure on a tender surface. It is particularly useful in this respect for covering large burnt surfaces.

4. It extreme adaptability.—It can be applied with great niceness to any part, so as to give rise to little or no inconvenience. When applied in any particular way, it retains the form impressed upon it.

5. It can be torn easily in any direction.—In this respect it contrasts favorably with oiled silk and gutta-percha.

6. It can be made of any required strength by folding it one, two, three, or more times, without becoming inconveniently thick.

7. It possesses a certain amount of adhesiveness, which is increased by the heat of the body, and thereby more effectually prevents evaporation from wet applications.—*Pharmaceutical Journal and Transactions, Feb.*, 1859.

RELATION BETWEEN FERMENTATION AND CRYSTALLIZATION.

In 1854, Mr. Schroeder, in connexion with Mr. Dusch, published a paper on fermentation and putrefaction, and showed that putrescent and fermentable substances could be indefinitely

preserved, if instead of leaving such matter in common air, they were placed in vases filled with air that had been filtered through cotton. Flesh, soup, and all kinds of alimentary substances can thus be preserved, if the precaution has been taken previously to boil them in water.

Mr. Schroeder shows that what he has established concerning fermentation and putrefaction, is also true of crystallization. It is well known that a saturated solution of sulphate of soda remains liquid as long as it is in vacuo, but solidifies on access of air. Mr. Schroeder establishes the fact that crystallization does not take place if the air is made to pass through a tube filled with cotton.*

Mr. S. explained the results of his experiments in 1854 by supposing that the air filtered through cotton is deprived of the spores of cryptogamic infusoria, which are the cause of putrescence and fermentation. If the experiment on the sulphate of soda tends to establish a relation between fermentation and crystallization, it serves to prove also that these phenomena can take place without the presence of these cryptogamia or infusorial germs, suspended in unfiltered air. This question which appeared to us finished by the earlier researches of Mr. Schroeder comes up anew. These facts do not interfere with the mechanical theory of Liebig, nor that derived from the recent researches of Pasteur on the propagation of fermentation.—*The American Journal of Science and Arts, January*, 1859.

REPORT ON THE ACTION OF WILLIAM McANDREW AND SON'S SCAMMONY.

BY A. B. GARROD, M.D., F.R.S., F.R.C.P.,

Professor of Materia Medica, Therapeutics and Clinical Medicine at University College, Physician to University College Hospital.

Every physician in the habit of prescribing scammony, either singly, or in combination with other purgatives, must have been struck with the uncertainty of its action, and of its liability at

* Journal de Pharmacie and de Chemie, 1854, T. xxv., p. 314.

one time to produce hyper-catharsis, and at another to prove almost inoperative. This uncertainty of action is chiefly due to the great difference in the quality of the drug, and chemical analysis has shown that the resinous matter, to which its activity is due, is most varying in quantity in different samples, being occasionally as high as 86 per cent., sometimes even as low as 5. It is also a well known fact that in the country from whence it is generally procured, no little ingenuity is exercised by those engaged in its collection, in seeking different means whereby it can be adulterated, and chalk, flour, gypsum, gummy and resinous exudations from other plants, besides coarser mechanical impurities, are often contained in it in varying quantities.

To avoid this liability to adulteration, and to ensure the employment of a uniform and pure drug, it has been proposed by Mr. Clark, of Sockia, in Asia Minor, to Dr. Williamson, that the roots of the *Convolvulus Scammonia*, instead of being tapped, as in the ordinary process of obtaining scammony, should be dug up, and the drug afterwards obtained by treatment of the dried root with alcohol, according to a process already made public. The physical qualities of scammony thus prepared differ considerably from that usually seen in commerce, and from virgin scammony, being non-porous, not producing a lather when rubbed with water, and, instead of possessing a musty or sour cheese-like odor, having an aromatic and fruity smell, exactly resembling the dried untapped root. In appearance, when in thin layers, it much resembles the scammony which is occasionally seen in the small shells (and regarded as the purest form of scammony), being transparent, and of a yellow color. In composition it is very rich in resin, being almost entirely composed of this matter in the STATE of a resinous acid. At different periods during the last two years, I have put the drug prepared by Messrs. William McAndrew and Sons' to a full and severe trial, comparing it, not only with the ordinary scammony found in the hospital, the origin of which was unknown, but also with that sold at Messrs. Bell and Co.'s establishment, and with a drug named "best virgin scammony," and supplied by Messrs. Horner and Son, and I will now proceed to give a short account of the results I have obtained.

The first few were made with a small specimen sent me three years ago, and in a note written at that time to Dr. Williamson, the conclusions I arrived at are thus summed up:—"I have made trial of your scammony as far as the small specimen sent me allowed, and have found it much stronger than the ordinary scammony of the hospital, which, perhaps, may be regarded as of average quality. Ten grains of the latter produced in one patient no effect, whereas the same amount of yours caused a free action of the bowels; the patient was subject to constipation. In other cases four grains acted moderately. To ascertain, however, the real value of the drug requires much more experience in its effect than the amount in my possession enabled me to obtain."

After this time, in 1857, I made the following trials; but, prior to giving the results, I should remark that some caution is necessary in drawing conclusions, not only upon the action of this, but of all other purgatives, as much depends upon the peculiarity of the individual to whom they are administered and the condition of the patient at the time, and from the results of one or even more observations the deductions cannot be depended upon. To avoid these sources of error, I have always, when practicable, administered the different kinds of scammony to the same patient, and also frequently alternated their employment. At first, the new scammony was tested with that obtained from Messrs. Bell and Co., and each was given in the form of pills made with the simple drug; the details of the effects are given in Table 1, Appendix.*

It will be observed that twenty-five trials were made, fifteen with the new scammony, and ten with Messrs. Bell's, and the results are, if anything, in favor of the new scammony being somewhat the stronger of the two; most of the observations are comparative, or made with the same doses and upon the same patients, but some few were made on single cases.

The next results were obtained also in 1857 from the new

*[The tables referred to in this paper have been omitted because of their great length, and because they are less interesting to the apothecary than to the physician.—Ed. Am. Jour. Pharm.]

scammony given as mistura scammonii, ten grains being rubbed up and suspended by means of compound tragacanth powder in each ounce of water. Of this mixture ten or eleven fluiddrachms were administrated to several patients, with the effects seen in Table 2, which are sufficient to enable us to conclude that it is a most powerful cathartic, in one instance producing as many as twenty-five actions on the bowels, although the same amount in other cases caused but moderate effect. Its operation was frequently attended with nausea and griping, which shows that scammony in its simple form is not so well suited for administration as when combined with other purgatives. Experience has long proved this to be the case, and in practice the fact is almost universally acknowledged and acted upon.

In November and December of 1858 I again took up the subject, and made a rather extensive series of trials with the new scammony, comparing its action with that of a specimen sent specially for the purpose by Messrs. Horner and Son, and called best virgin scammony. The drugs were given in the form of pills, and in ten-grain doses to each patient, and the effects are detailed in Table 3 (A and B). Thirty trials were made, the majority comparative, but a certain number on separate patients. From a review of the contents of the table it will be evident that the new scammony is at least equal to the virgin scammony as a purgative.

Table 4.—Exhibits a series of comparative and other trials made with the same kinds of scammony administered in a fluid form, or rather in the state of suspension, as mistura scammonii, and here again the new scammony shows itself quite equal to the virgin variety.

It next became a subject of interest to know the effect of the new scammony when given in combination with other purgatives, and the compound colocynth pill of the present London Pharmacopœia was selected as the form to be employed. Two quantities were made up with the same aloes, the same simple extract of colocynth, &c., the only difference being this—that in one the new scammony was introduced, in the other the same quantity of Horner's virgin scammony, and the pills were administered in ten-grain doses to each patient. Twenty-six trials were made,

and are detailed in Table 5, and the results appear somewhat in favor of the new scammony, and there can be no doubt of its being at least equal, when in combination, to the best virgin scammony.

In Table 6, the results of some comparative trials made with Horner's scammony and the resin obtained from the same by means of ether, are given, and it will be there observed that the scammony made use of in many of my observations was one whose quality cannot be doubted, seeing that it yielded 86 per cent. of resin soluble in ether, whereas the London and Edinburgh Colleges only demand that 78 and 80 per cent. of resin should be present. No great difference could be discovered between the two drugs, but this fact I do not think difficult to explain, as only a difference of 14 per cent. of resin existed, and, unless the trials were very numerous, this would be unable to be detected. I think it would be more easy to do so when the scammony is given in combination, than when administered alone.

From these numerous observations, one hundred and twenty in number, together with many others which have not been tabulated, I am quite convinced that the scammony prepared by the new process from the untapped root is quite equal, as a remedy, to the very best virgin scammony met with in commerce, and equal, in fact, to the resin which is extracted from commercial scammony by means of ether; and it possesses this most important advantage over the scammony of commerce, namely, of being entirely free from the frauds which are almost constantly practised upon it in the country where the plant grows, and in which it has hitherto been collected, and, therefore, being perfectly uniform in its physical characters, composition, and therapeutic action. There can, therefore, be no objection, but, on the other hand, manifest advantage, in employing it in the place of the scammony commonly met with.—*London Pharm. Journal, March*, 1859.

Varieties.

Preservation of Photographic Proofs on Paper. By M. Gaudinet.—The author was led to this process, not by chance, but by an attentive examination of what was produced in effaced proofs, in which the design was not destroyed, but only disguised by a colored layer spread uniformly over its surface, and, according to circumstances, either on the surface of the paper, or on the adjacent layers. He compares the annihilation of the image in this latter case, to what is produced when we place under a design drawn on tracing paper, a sheet of a dull color. Seeing how this colored layer is produced in both cases, and understanding then why the proof on paper was altered, whilst those on glass were preserved, he thought that if he could succeed in rendering the paper impermeable, at the same time retaining its color and its semi-transparency, he would have solved the problem. For that purpose, he employed a process which he has used since 1855 for making troughs of card-board instead of the glass or porcelain troughs used in photography. The following is his mode of operating:—

"I dissolve," he says, "a certain quantity of gutta percha of commerce in benzine Colas; I decant at the end of a few days, so as to have only the clear part. I plunge my paper into this solution, sheet by sheet, and remove it almost immediately; then suspending it by one corner, I allow it to dry. I afterwards take these leaves, which contain between their fibres a sort of dust of gutta percha, but not a varnish, and I hold them one by one, before a good fire. All the grains of gutta percha then unite and cover entirely the fibres of the paper, forming an almost impermeable internal varnish.

"I albumenize this paper, which has lost nothing of its transparency, (albumen 100, rain water 25, chloride of sodium 6.) I leave it to dry, and sensitize with a solution of 15 per cent. of crystallized nitrate of silver. I drain and dry before a gentle fire; I take the positive proof under the cliché as with ordinary paper, and I fix with hyposulphite of soda, of 10 or 15 per cent.; but this operation is abridged, so that the proof is fixed after a few minutes, as with proofs on glass, and of a very fine sepia aspect. If we wish to strengthen with chloride of gold, it is done in the ordinary way, nothing preventing this operation.

"The washings, instead of lasting from 12 to 24 hours, may be completed in a quarter of an hour, and the proof is of admirable transparency, the paper, moreover, retaining all its whiteness.—*London Chemist, Oct.*, 1858, *from Comptes Rendus, August* 2, 1858.

Peat Gas.—It is stated in the *Dublin Freeman*, that a village has recently been successfully lighted by gas made from bog-peat. More than a year ago, John Wilson, Esq., J. P. Daramona, of Westmeath, had gas works erected at his private residence, to light up that building, the out-offices, farm-yards, &c. Since that time he has used no other kind of artificial light than what was made from the turf of his locality. Within the last four months, Mr. Wilson arranged with Mr. Johnson, the patentee of the process employed, for the erection of a second, and more extensive apparatus, in order to light with turf gas a village on his property. The gas produced gives a pure and brilliant light. The enthusiasm of the people, who had assembled to see the ceremony of first lighting the gas became loudly enthusiastic; cheers, and every possible demonstration of gladness were vented at the success of the undertaking, and the indelible proof given of the fact, that there is something in the bogs of Ireland. —*London Chemist, Oct.*, 1858.

Preparation of Basic Acetate of Lead.—Prof. Rochleder states, that when a silver vessel is used for the solution of oxide of lead in acetate of lead, the production of the basic salt takes place much more rapidly than when it is heated in glass, porcelain, or tinned vessels. The solution of the oxide of lead is almost instantaneous, so that considerable quantities may be prepared in a short time, even with a small silver vessel.—*Lond. Pharm. Journ. Sept.*, 1858.

Minutes of the Philadelphia College of Pharmacy.

The Thirty-eighth Annual Meeting of the Philadelphia College of Pharmacy was held at the College Hall, Third Month 28th, 1859. Present 24 members. The President in the chair.

The minutes of the Semi-Annual Meeting and of the Board of Trustees for the last six months were read.

The following Graduates in Pharmacy have been elected Resident Members of the College by the Board.

Wm. R. Warner,	George J. Scattergood,
William Evans, Jr.,	George C. Evans,
Edward Donnelly, M.D.,	Emelius Herwig.

The following gentlemen, proposed to this meeting by the Board of Trustees, as candidates for resident membership, were balloted for and duly elected.

Henry Landschutz,	Peter J. Hassard.

By the Minutes of the Board, the College is informed that the degree of *Graduate in Pharmacy* was conferred upon the following students of our school, at the commencement held on the 17th inst.

Graduating Class.		Subject of Thesis.
HARVEY ALLEN	*Tenn.*	Podophyllin.
WM. F. BUCHANAN	*Pa.*	Abieteæ—Oleum Terebinthinæ.
THOMAS R. COOMBE	*Pa.*	Mining & smelting of Lead ores in Illinois.
CHARLES G. DODSON	*Pa.*	Agathotes Chirayta.
POWHATAN E. DUPUY	*Va.*	Proximate analysis of plants.
CHARLES L. EBERLE	*Pa.*	Pyrus malus.
WILLIAM EYRE	*Pa.*	Hydrastis Canadensis.
W. T. GARWOOD	*Pa.*	The solubility of astringent extracts.
HENRY T. GEYER	*Pa.*	Acetic acid.
DAVID W. HARRY	*Pa.*	Liatris spicata.
J. AUGUSTUS HEINTZELMAN	*Germany*	Anagallis arvensis
CHARLES L. JEFFERSON	*Pa.*	Eryngium.
FRANCIS KENNEDY	*N. J.*	Stillingia.
THOMAS A. LANCASTER	*Pa.*	Chem. invest. of acid vegetable juices.
A. HOPE MCLEROTH	*Ill.*	Lactucarium.
THOMAS NOBLE	*Pa.*	Thuja occidentalis.
GEORGE K. RICHARDS	*Pa.*	Apium Petroselinum.
JAMES W. ROBBINS	*N. J.*	Podophyllum peltatum.
ROLAND SEEGER	*Pa.*	Hydrargyri Iodidum.
THEOPHILUS H. SMITH	*Pa.*	Helianthemum Canadense.
JOHN WARD	*Pa.*	Hyoscyamia.

The Latin Label Committee reported that they have recently published a new edition of the book of Bronzed Labels for shop furniture, and propose to issue shortly a book of small labels, with Synonyms, Symbolic Formulæ, &c. including materia medica, pharmaceutical and chemical labels, adapted to Cabinets of Specimens.

The report of the Treasurer of this Committee showed a balance of available funds, from which, on motion, an appropriation was made to the Sinking Fund.

The Committee on the Sinking Fund made a report, showing a balance of $57.07 in their hands, after paying for the repairs, insurance, &c., directed by the College.

The Annual Report of the Publication Committee was read and approved as follows:

"The Publishing Committee report that the Journal has been regularly issued during the past year. The number of subscribers has been gradually increasing since last report. It has been the endeavor of the Editor, during several years past, to confine the topics of the Journal to subjects strictly professional, except in a few instances, and much matter relating to theoretical and analytical chemistry, which finds a place in European Journals of Pharmacy, has been excluded, in order to devote more space to articles of practical value and general interest.

The annexed statement of the Treasurer of the Committee exhibits a favorable condition of its finances.

The occasional demand for sets of back volumes has raised the question whether it will not be advisable to republish several numbers now out of print, and thus enable the Committee to dispose of the considerable number of volumes rendered incomplete, as a set, owing to this cause."

Signed on behalf of the Committee.

Communications were received from William P. Troth and Robert Shoemaker, resigning their membership in the College. They were accepted.

On motion, a committee of four was ordered, to propose to the next meeting an amendment to the laws of the College, providing for the release of the older members from the annual contributions. Daniel S. Jones, Ambrose Smith, Thomas P. James, and S. F. Troth, were appointed to the service.

Frederick Klett, having retired from the drug business, and having aided in the support of the College for 38 years, the entire period since its establishment, it was, on motion of S. F. Troth, unanimously resolved, that his annual contributions be remitted in advance as long as he shall continue a member.

The following preamble and resolutions, offered by Prof. Procter, were unanimously adopted.

Whereas, The period for the decennial revision of the U. S. Pharmacopœia has nearly arrived, (the National Convention for that purpose convening in May, 1860); and whereas, this College is one of the pharmaceutical bodies, lawfully entitled to send three delegates to that convention; and whereas, each body thus represented is invited and expected to "submit the Pharmacopœia to a careful revision, and transmit the results of their labors, through their delegates;"

Therefore be it Resolved,

1st. That a Revising Committee of ten members, with power to add to their number and fill vacancies, be appointed to execute the work and report at the next Annual Meeting, in a form suitable for transmission to the National Convention.

2d. That this Committee shall possess the power to draw on the Treasurer for such funds, not exceeding twenty dollars, as shall be needful to carry out the object of their appointment.

3d. That three delegates be appointed in September next, to represent this College at Washington.

The chair appointed the following members to be the Pharmacopœial Committee.

Wm. Procter, Jr., Chairman.	Ambrose Smith,
T. S. Wiegand,	Edward Parrish,
S. S. Garrigues,	A. B. Taylor,
Wilson H. Pile,	Charles Bullock,
Jas. T. Shinn,	Wm. R. Warner.

The annual election for officers was now ordered. J. C. Savery and J. T. Shinn, acted as tellers.

They reported the following election:

President.—Charles Ellis.
1st Vice-President.—Samuel F. Troth.
2d Vice-President.—Dillwyn Parrish.
Treasurer.—Ambrose Smith.
Recording Secretary.—Edward Parrish.
Corresponding Secretary.—Wm. Procter, Jr.

Eight Trustees, to fill the vacancies occurring at this date.

Robert Bridges, T. S. Wiegand,
F. C. Hill, S. S. Bunting,
J. C. Savery, D. S. Jones,
T. P. James, T. Morris Perot.

Publishing Committee.

Charles Ellis, Dr. R. Bridges,
A. B. Taylor, Edward Parrish.
Wm. Procter, Jr.

Committee on Sinking Fund.

S. F. Troth, E. Parrish.
Ambrose Smith.

Delegates to the American Pharmaceutical Association.

Charles Ellis, T. P. James,
Wilson H. Pile, Charles Bullock,
Daniel S Jones.

Then adjourned.

Edward Parrish, Secretary.

MEDICAL CONVENTION
FOR
REVISING THE PHARMACOPŒIA OF THE U. STATES.

The Medical Convention for revising the Pharmacopœia, which met at Washington, in May, 1850, provided for assembling a Convention for the same purpose, in the year 1860, by the following resolutions:—

"1. The President of this Convention shall, on the first day of May, 1859, issue a notice requesting the several incorporated State Medical Societies, the incorporated Medical Colleges, the incorporated Colleges of Physicians and Surgeons, and the incorporated Colleges of Pharmacy, throughout the United States, to elect a number of delegates, not exceeding three, to attend a general Convention, to be held at Washington, on the first Wednesday in May, 1860.

"2. The several incorporated bodies thus addressed, shall also be requested by the President to submit the Pharmacopœia to a careful revision,

and to transmit the result of their labors, through their delegates, or through any other channel, to the next Convention.

"3. The several Medical and Pharmaceutical bodies shall be further requested to transmit to the President of this Convention, the names and residences of their respective delegates, as soon as they shall have been appointed, a list of whom shall be published under his authority, for the information of the medical public, in the newspapers and medical journals, in the month of March, 1860."

In accordance with the above resolutions, the undersigned hereby requests the several bodies mentioned to appoint delegates, not exceeding three in number, to represent them in a Convention for revising the Pharmacopœia of the United States, to meet at Washington, on the first Wednesday in May, 1860; and would also call the attention of these bodies to the second and third resolutions, and request compliance with the suggestions therein contained.

GEO. B. WOOD,
President of the Convention of 1860.

Philadelphia, May 1st, 1859.

N. B.—Medical and Pharmaceutical Journals will please copy the above notice.

Editorial Department.

Library and Cabinet of the Philadelphia College of Pharmacy.—Those of our readers who are interested more immediately in the College, will be pleased to learn that the Library Committee have been exerting themselves during several months past, since the provision of additional case room for books, and by purchase and donations have increased the library quite considerably, as will be observed by their report at page 289. We take advantage of the opportunity to suggest to the members and others interested, that they examine their collections, and see if there be not some volumes appropriate for the College Library, that they do not wish to retain, and which they are willing to donate to the Institution. Any member of the Library Committee, if notified, will send for books which may be presented. The Committee have also prepared a catalogue of the books belonging to the library which is published with this number, in addition to the regular number of pages, and which will enable members to know what books are already in the collection.

The Committee on the Cabinet are about to prepare bottles for the reception of specimens in the cases recently appropriated for the purpose of extending the Museum, and they desire to give information to the members and others friendly to the Institution, that they will be happy to receive

donations of specimens in Materia Medica, Chemistry and Pharmacy, to add to such as may be procured by the appropriation to the Committee.

Hypophosphite of Quinia.—Prof. J. Lawrence Smith, in a letter to the Editor, dated Louisville, April 20th, 1859, informs us that he has made a new salt of quinia, the hypophosphite, which he had brought to the notice of the College of Physicians and Surgeons of that place, and recommended its use in those cases of phthisis, scrofula, cachexy, &c., where the sulphate of quinia is now used. It is soluble in 60 parts of water at 60° F., is extremely light and feathery, like acetate of quinia, and decidedly bitter. Prof. Smith is studying its chemical history, which he promises to send to us when completed.

The London Chemist.—We are informed that this useful journal has been discontinued. This is greatly to be regretted, as some of our most valuable selections have been derived from its pages. If true, we hope its suspension is only temporary.

The American Dispensatory. By John King, M. D., Prof. of Obstetrics, &c., in the Eclectic Medical College, &c. &c. Fifth edition, revised and enlarged from "the American Eclectic Dispensatory." Cincinnati, Moore, Wilstach, Keys & Co., 1859, pp. 1475, octavo.

The volume, of which the above is the present title page, is a new edition of the American Eclectic Dispensatory which was noticed at page 567, 1854, of this Journal, and the same book upon which an injunction was laid by the authors of the United States Dispensatory for its extensive plagiarisms. It became necessary to rewrite the work in such parts as were affected by the injunction, after the matter was compromised, and this book is the result of the labor. The ponderous character of the volume renders a notice of it based on an examination of its contents so formidable a task, that we have been compelled, for want of the necessary time, to give only a general notice of the first portion of the work, leaving for the future any criticisms which may be suggested by the further examination of the pharmaceutical portion and appendix, and a closer view of the chapters on Materia Medica.

In comparing it with the previous edition, the reader is struck with the absence of the voluminous chapter on the natural orders of plants, much more appropriate to a work on botany, and well omitted. Part I, on Materia Medica, comprises 970 pages, and describes the organic and mineral substances recognized as useful by the Eclectic practitioners. In treating of the Materia Medica, the arrangement is alphabetical, but as the U. S. Pharmacopœia is not recognized as an authority, drugs are placed in the order of their botanical or scientific names. In the absence of any recognized pharmacopœial authority, perhaps no better arrangement could

have been adopted. In describing each drug, after its botanical characters, its history is noticed, which is made to include the habits, geographical distribution and chemical characters of the plant. Under the head of properties and uses, the medical properties and applications of drugs are described, with their doses. All the saline and other inorganic substances recognized in Eclectic practice are arranged under their ordinary Latin chemical names, as Argenti Nitras, Cupri Sulphas, Plumbi Acetas, &c. In the previous edition, the author had made free use of the papers on American plants, published in the American Journal of Pharmacy and other original sources, without, except in a few instances, giving credit to their authors, a species of injustice against which we protested in our former notice. We are pleased to observe that in the present edition this fault has in great measure been corrected. In reading over a number of chapters there is an irregularity observable in the treatment of subjects which must be attributed to the imperfect digestion which the subject matter has undergone in the mind of the compiler; and, indeed, the abundant quotations from standard works, and occasionally their want of fitness in position, render it apparent that in many instances, the labor has been rather of the scissors than the brain. It follows, therefore, that in such portions of the work, Dr. King ceases to be an authority in Materia Medica. A compilation must be something more than a collection of quotations to be an authority. It must be a collection of facts that have been carefully collated and compared, and when of doubtful value, the judgment of the compiler must come in to the assistance of the reader. We admire the perseverance and industry with which Dr. King has met his difficulties, albeit they were of his own procuring; we esteem this portion of his book as a great improvement on others of Eclectic origin that have come under our notice; and he certainly is Eclectic in his sense of the word, in seeking facts from various sources to swell his volume, yet he cannot be considered as a master in science. There are few persons well qualified for the task of writing a work on Materia Medica. It is a great mistake to look upon a Dispensatory as a mere compilation in the ordinary sense of that term. The author of such a work must be a botanist in something more than reading, and he must be acquainted, to some extent, with zoology and mineralogy, else he will be constantly at the mercy of imperfect observers by being unable to correct their errors or get at the truth by comparison. He must be a druggist in the sense of a practical acquaintance with drugs, else he cannot describe them from the commercial stand-point; he must be a pharmaceutist, practically familiar with the processes of the Pharmacopœias, and with the action of menstrua and the reactions of organic matter occurring in them; and above all, he must be a chemist, theoretically and practically: chemistry is the touchstone by which he is to satisfy himself in regard to species and varieties, to draw distinctions where botany fails to lend her aid, and to satisfy himself of the value of the numerous observations daily offered in the Journals; and lastly, the author of a Dispensatory must be

a practical therapeutist, familiar with the physiological action of medicines, and with the principles on which their curative action is based when they are administered to the sick.

Judged by these rules, "The American Dispensatory," it is believed, will be found wanting: the deficiencies arise chiefly from the lack of practical science; the author has the energy, the perseverance, the ambition and the materials requisite to the structure he has sought to raise, but he has not had the training in scientific observation, nor dipped sufficiently deep into the source-springs of knowledge, to become as yet a master workman. We say this in no unkind spirit; on the contrary, we believe Dr. King's work, as a collection of facts bearing on the American Materia Medica, possesses very considerable value, and is full of useful hints for investigation. We have heard it objected that the therapeutical portion of the work is more a detail of experience in cures by the several agents than a lucid exposé of the medical properties and modes of action of those agents, but this mode of presenting the subject may be intentional, and suited to the practitioners to whom it is more specially addressed. We have given a pretty thorough glance over the first portion of the book, and have found much to interest us, numerous instances where pruning would be useful, and some errors incident to hasty compilation or to misapprehension of the meaning of authors. We have made notes of these, and propose in a future number to give some account of the pharmaceutical portion. Meanwhile, we feel no hesitation in saying that this work contains much that is useful to apothecaries as well as physicians. It is well printed on good paper, and may be had at Armstrong's, 722 Market st.

Journal and Transactions of the Maryland College of Pharmacy, published by authority of the College, under the supervision of a Publishing Committee, consisting of G. W Andrews, W. S. Thompson, Charles Caspari, J. Jacob Smith and Alphæus P. Sharp. Edited by W. S. Thompson. New Series. March, 1859. Vol. 1, No. 1, pp. 48, octavo.

Our Baltimore cotemporary, after the experience of last year as a gratuitous issue, has come out and joined the body of regular Pharmaceutical Journals as a Quarterly of 48 pages. She is welcomed right heartily, and with so fair a beginning, it will be safe to augur for her a successful future. The tone of the Maryland Journal is of the true kind, and with a corps of earnest workers to support her, until the radicles of her influence extend into the soil of the profession, so as to draw sustenance from beyond the College precincts, she will be safely established.

Trials of a Public Benefactor, as illustrated in the discovery of Etherization. By Nathan P. Rice, M.D. New York, Pudney & Russell, 1859, pp. 460, 12mo.

This book, written by a medical friend of Dr. W. T. G. Morton, of Boston, from documents and information supplied by the latter, gives a

detailed account of the life of Dr. Morton, of the incipient steps in his discovery of etherization, and of those subsequent occurrences bearing on the various attempts to get an award from Congress for the discovery, as a great public benefit, in which the acts of the rival claimant, Dr. C. T. Jackson, of Boston, are fully discussed and exposed. The mass of testimony of a documentary character is so great, and the eminent names favorable to Dr. Morton's claims so numerous, that one is almost irresistibly compelled to acknowledge that the agency of Dr. Morton in the matter of the discovery of the application of etherization, as a pain-relieving agent in surgical operations, and in making it a practical reality by his bold experiments, is beyond a doubt, and it is this which constitutes the greatness of the discovery. It is to be regretted that so much difficulty has occurred in establishing the truth in regard to this discovery. Probably if Dr. Morton had been less inclined to reap the pecuniary reward of his discovery by seeking a patent, and thrown himself at once on the magnanimity of the profession and the world, his claim would have been acknowledged without opposition.

The Druggist, a monthly newspaper for the trade. Cincinnati, April, 1859, vol. 1, No, 1, pp. 16 quarto.

The above is the caption of a new pharmaceutical monthly, after the style of the Druggist's Circular, received just as we were closing our last page. It is edited by Henry E. Foote, M. D., who, in his introductory remarks, refers to an able corps of contributors. Among these, we doubt not, that our friend E. S. Wayne will occupy a prominent position, as in the first number we find two articles from his pen. Our Cincinnati friends now have a medium through which to give expression to the suggestions and discoveries that have been so long accumulating within their borders, and we hope to hear that their College, stimulated by the influence thus created, will arouse from her lethargy, and like that at Baltimore, commence a new era in her history. The subscription price of "The Druggist" is one dollar, and we cheerfully place it on our list of exchanges.

OBITUARY.

Prof. William Tully.—This distinguished physician and pharmacologist, formerly of Yale College, so long known for the extent and varied character of his medical acquirements, and especially for his intimate acquaintance with our indigenous Materia Medica, died on the 28th of February, at Springfield, Massachusetts.

M. J. L. Lassaigne.—With the *Journal de Chimie Medicale* for April comes the announcement of the decease of one of its original editors, M Lassaigne. He has long been a teacher of Chemistry, and for thirty years a contributor to the Journal de Pharmacie, which is interspersed with his numerous discoveries and observations, among which was the discovery of Delphinia.

REPORT OF THE LIBRARY COMMITTEE,

AND

CATALOGUE OF BOOKS

IN THE

Library of the Philadelphia College of Pharmacy.

Agreeably to the By-Laws of the Board of Trustees of the Philadelphia College of Pharmacy, the Committee on the Library

REPORT,

That they have been industriously engaged in having the new cases for Books completed, and have classified, arranged and made out a new Catalogue of all the books belonging to the College Library, intending, with the approbation of the Board, to have it published in the next number of the Journal. This Catalogue embraces the donations to the Library since this time last year, as follows:

From Dr. S. W. Mitchell, being a valuable donation from the Library of his deceased father Dr. J. K. Mitchell of	100	volumes.
" Dr. Robert Bridges,	4	"
" Alfred B. Taylor,	10	"
" Dr. Wilson H. Pile,	5	"
" Edward Parrish,	7	"
" Samuel S. Garrigues,	8	"
" Thomas P. James,	21	"
" Samuel N. James,	30	"
" Samuel F. Troth,	33	"
" The Secretary of the Commonwealth of Penna., by direction of Governor Wm. F. Packer,	29	"

Also 2 Geological Maps of the State.

Making together 247 volumes. These liberal donations have stimulated your Committee, and induced them to issue a Circular, asking the friends of our Institution for still further contributions.

Library of the Philadelphia College of Pharmacy.

CIRCULAR.

More than twenty years ago the College of Pharmacy commenced the formation of a library for the use of its members and their apprentices, when by the liberality of some of the early friends of the Institution, and a small appropriation from the College, about 500 volumes were collected; soon after this effort the College procured a lot on ground rent, and erected their present Hall on Filbert street above 7th. This large expenditure has prevented the College from doing any thing more for the Library except to bind periodicals taken in exchange for our Journal, until the past year; when finding ourselves entirely clear of the debt incurred in building the Hall; and our School of Pharmacy, for which the building was mainly erected to accommodate and promote, being in a very prosperous condition, we have come to the conclusion that the next most important object to promote the interest of our profession is the building up of our Library, and extending its usefulness, by collecting together everything we can procure in relation to the early as well as present history of Pharmacy and its collateral branches; and as the means of the College are still small, we earnestly request from our members, and others interested in the prosperity of our useful Institution, such books as they may be willing to spare from their own collections, which will be thankfully received and placed in our new cases recently prepared for that purpose.

Respectfully,

SAMUEL F. TROTH, No. 630 Market street.
WILLIAM PROCTER, JR., cor. of 9th and Lombard.
EDWARD PARRISH, corner of 8th and Arch.
SAMUEL N. JAMES, No. 630 Market street.
SAMUEL S. GARRIGUES, No. 108 N. 5th street.

*Committee on Library.**

Philada., 3d mo. 7th, 1859.

* A few lines per Blood's Dispatch, informing either of the above mentioned Committee when and where to send for books, will be promptly attended to.

CATALOGUE OF BOOKS

BELONGING TO THE

Library of the Philadelphia College of Pharmacy.

Chemistry, &c.

Accum, F., 434, 437. System of Chemistry, 4 vols., Philadelphia, 1814.
Aikins, A. C. R., 80, 81. Chemical Dictionary, 2 vols., London, 1807.
Anderson, J., 648. Essay on Lime as a manure. Boston, 1799.

Barns, J., 671. Chemical Pocket Book. London, 1844.
Baume, P. M., 645. Manuel de Chymie. Paris, 1765.
Beche, H. T., 538. A Geological Manual. London, 1831.
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" " 661. do. Baltimore, 1809.
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Black, J., 487, 489. Elements of Chemistry, 3 vols., Philadelphia, 1807.
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